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REPORT

ON THE

SANITARY ADMINISTRATION

OF THE

PUNJAB

FOR THE YEAR 1882.



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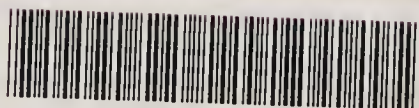
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From
THE LONDON SCHOOL OF HYGIENE
AND TROPICAL MEDICINE,
KEPPEL STREET,
LONDON, W.C.1.



22503494359



1	2	3	4	5	6	7	8	9	10
DISTRICTS.	Number of Officers appointed as District Officers.	Names of District Clerks.	Population of the District.	Date of first entry of Clerks in the year.	Date of last entry of Clerks in the year.	Total number of Clerks during the year.	Period of duration of the Marwar Agency of the District.	Number of District Clerks.	Number of Not Clerks.
							From To		
Dahla	1	Dahla	116,392	7th January	6th September	3	.. ..	16	1
	2	De. Sultane	44,361	25th ..	.. ..	2	.. ..	16	1
Karnal	24	Karnal	52,688	20th March	10th July	2	.. ..	90	2
	27	Dahanu	42,261	2nd ..	2nd March	3	.. ..	64	1
Rohat	70	Jyagar	62,803	17th February	2nd February	1	.. ..	85	1
	88	Jopdatt	80,216	8th May	20th May	3	.. ..	145	1
Uniaia	88	Shahdud	62,276	9th April	8th April	1	.. ..	120	1
	94	Thaneear	34,124	15th ..	15th ..	1	.. ..	49	1
	108	Kharur	84,068	20th December	20th December	1	.. ..	220	1
Ludiana	108	Sahawal	41,321	12th August	12th February	1	.. ..	131	1
	113	Machhwa	42,260	16th May	16th May	1	.. ..	72	1
Machhwa	133	Shahdudpur	1,25,458	7th February	7th February	1	.. ..	278	1
	150	Jamalia	75,337	20th August	20th August	1	.. ..	233	1
Amritsar	113	Loyke	81,000	23rd May	20th May	1	.. ..	140	1
	170	Dunagur	64,379	7th ..	7th ..	1	.. ..	848	1
Gudugay	126	Kot Nouns	117,967	20th April	13th August	2	.. ..	224	1
	144	Dunah	30,840	30th January	31st February	1	.. ..	102	1
Lahore	217	Lahore	181,446	12nd November	2nd November	1	.. ..	12	1
	233	Shahdud	67,634	20th August	20th August	2	.. ..	171	1
Gujranwala	217	Hafidat Ali	61,842	10th September	10th September	1	.. ..	210	1
Ferozepore	251	Mukian	2,363	25th ..	25th ..	1	.. ..	101	1
Bawalpindi	271	Gajar Khan	40,666	8th June	8th June	1	.. ..	145	1
	314	Chawal	62,257	2nd July	2nd July	1	.. ..	120	1
Jhelum	290	Jalpur	34,748	22nd June	22nd June	1	.. ..	80	1
	300	Dina	20,377	7th July	7th July	1	.. ..	119	1
MuzSargodha	374	Rodhnowali	31,206	7th August	7th August	1	.. ..	81	1
Banau	421	Banau	49,250	6th October	6th October	1	.. ..	23	1
	427	Lakimnara	21,288	7th ..	7th ..	2	.. ..	45	1
Total	..	..	1,810,248	..	..	20	.. ..	4,423	20

III.—The fractional figures in red ink indicate the dates of the first cases in each circle.

REPORT
ON THE
SANITARY ADMINISTRATION
OF THE
PUNJAB
FOR THE YEAR 1882.



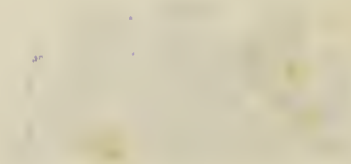
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No. _____

FROM

DEPUTY SURGEON-GENERAL H. W. BELLEW, C. S. I.,

Sanitary Commissioner, Punjab,

TO

W. M. YOUNG, ESQUIRE, C. S.,

*Secretary to Government, Punjab.**Dated Lahore, 1st June 1883.*

SIR,

I HAVE the honor to forward herewith, five copies of my Annual Sanitary Administration Report of the Punjab for the year 1882, and to state that the instructions contained in your letter No. 319, dated 4th May 1883 will be fully acted up to in future.

2. The Vaccination Returns of the past year have been altered from the Calendar to the Official year 1881-82 in order that the results in the different Provinces might, as far as possible, admit of fair comparison.

I have, &c.,

H. W. BELLEW,

DEPUTY SURGEON-GENERAL,

Sanitary Commissioner, Punjab.



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READ—

Report by Deputy Surgeon-General BELLEW, C. S. I., Sanitary Commissioner, Punjab, on the Sanitary Administration of the Province for the year 1882.

IN the statements appended to this Report, the ratios of births and deaths have been calculated on the figures of the Census of 1881. The district of Siálkot returns the highest birth rate (44·73), and the statistics of five other districts yield rates exceeding 40 per mille; the rates of Frontier districts are generally much below the average, the rate of Pesháwar being less than 20, and the rates of Kohát and Dera Gházi Khan not much higher.

2. The number of males born largely exceeded the number of females born, the mean proportion of male to female births, for the whole Province, being 116 to 100; in no district was it less than 108, and in the Frontier districts the excess above the mean was very great, ranging from 119 males to every 100 female births in Hazára to 168 in Pesháwar. The registration of both births and deaths is more imperfect in the Frontier districts than elsewhere, and there appears in these districts to be special unwillingness to report the births of females.

3. The mean death rate of the Province for the year was 27 per mille, against 30 per mille the rate of the previous year. The rates of the districts of Jhang, Mooltan, Sháhpur and Muzaffargarh, however, were much above the mean of the Province, ranging from 33 to 45 per mille, and the subsequent sections of the Report show that the causes of mortality were exceptionally prevalent in those districts.

4. In paragraph 9 of his Report the Sanitary Commissioner states that the death ratio of males was as usual higher than that of females in every district. Dr. Bellew is no doubt speaking of the actual number of deaths in either sex; but, as will be seen from column 8 of Statement No. II, the true ratio of male and female deaths to population shows the reverse. The mean of the death ratios of the two sexes for the five preceding years was equal; but in 1882 the mean death ratio of the female population was slightly in excess of the male ratio, and in many districts the excess was great; in Muzaffargarh, for instance, the ratio of deaths per mille of females was 49, while the male ratio was 42. The only districts in which the ratio for males was higher than the ratio for females were the districts of the Delhi and Hissár Divisions, and the districts of Kángra, Gurdáspur, Siálkot, Gujráat, Bannu and Pesháwar.

5. The deaths of males registered were in the proportion of 115·9 to every 100 female deaths, and not 111·6 as given in the Report. The correction has been made by the Sanitary Commissioner in a list of errata. The following figures show the proportion of males to females in the population at the Census of 1881 and in the number of births and deaths registered in 1882:—

Males to every 100 females—

<i>Living in 1881.</i>	<i>Born in 1882.</i>	<i>Died in 1882.</i>
118·0	116·1	115·9

As more males are born annually than females, the male population of the Province considerably preponderates over the female, and consequently the

deaths of males exceed in number the deaths of females, but the ratio of mortality on the number living was higher for females than for males in both 1881 and 1882.

6. The rates of mortality at different periods of life are for the first time shown in Statement No. IV. The mortality amongst children is shewn by paragraph 14 of the Report to be very great,—23 per cent. of the infants born, or nearly one-fourth die in the first year of life, and the rate of mortality continues high among children between the ages of 1 and 5; after this it falls rapidly, and the period between 10 and 15 years is that of lowest mortality.

7. Among children under 5 the ratio of mortality is lower for females than for males; at ages between 5 and 10 the ratios for the two sexes are nearly equal. At all ages from 10 to 40, females die at a higher rate than males, but the excess is greatest between 20 and 40; above 40 and up to 60 males die at a higher rate than females.

8. The mean rate of mortality among Muhammadans was 27·21, against 21·37 for Hindús; Muhammadans having largely preponderated in those districts above noted, in which the causes of mortality were unusually prevalent.

9. The following figures show the mortality from the more common diseases during the year compared with the mortality from the same causes in the previous year:—

	1881.	1882.
Cholera ...	5,207	39
Small-pox ...	6,749	6,379
Fevers ...	355,279	346,674
Bowel complaints	17,281	15,965
Injuries ...	5,695	5,753
Other causes ...	129,568	129,989
Total ...	519,779	504,799

10. A slight outbreak of cholera, which is described in the Dispensary Report, but which does not appear to have come under the notice of the Sanitary Commissioner, occurred in the town of Jagádhri, on the eastern border of the Province. Eighteen cases, three of which were fatal, came under the treatment of the Assistant Surgeon in charge of the dispensary between the 4th and 19th May 1882. With this exception the Province was apparently free from epidemic cholera throughout the year. The remarks on cholera, contained in paragraph 21 of the Report, touch upon matters the discussion of which is not considered by the Government of India to be desirable; but the Sanitary Commissioner, who received the orders after his Report was prepared, has intimated in his covering letter that these instructions will be strictly observed in future.

11. The mortality from fever was nearly as great as in the previous year, but there was great difference in its distribution. In 1881 the prevalence of fever was unusually severe in the districts east of the Chenab river. In 1882 it prevailed with great severity in the districts west of that river, and especially in the districts lying along the banks of the Jhelum and the Indus. Many interesting details of the prevalence of this fever, and the causes from which it apparently arose, are given in the section of the Report devoted to the subject. As usual, the mortality from fever fell with special severity upon the infant population; of 617 deaths recorded from this disease between the months of August and November in 53 villages of the Jhang District, 298, or nearly one-half, were of infants under one year of age. The Civil Surgeon of Sháhpur also observed a like excessive incidence of mortality from fever on the infant population of his district.

12. The mortality from bowel complaints was considerably below the average of former years. Under the head of "Injuries" are included deaths by

suicide, fatal accidents and deaths by wild beasts and snake-bites. The number of suicides recorded was larger in 1882 than in the previous year, and, as in former years, women committed suicide in larger numbers than men.

13. Deaths from snake-bites were also recorded in larger numbers. It is probable that the progressive increase in the number of deaths from this cause is in some measure the result of improved registration. The highest numbers, in proportion to the population, are recorded in the Gujrán-wála, Shahpur, Jhang, Montgomery and Muzaffargarh districts, in which the population is comparatively sparse and wide tracts of land lie uncultivated. The subject has recently been under the consideration of the Lieutenant-Governor, and Local Committees have been invited to offer rewards more freely for the destruction of venomous snakes.

14. The Vaccination tables appended to the Report show the operations for the official year in accordance with the orders of the Government of India, but they are incomplete as compared with previous year's returns. The comparative statement showing the number of persons primarily and successfully vaccinated in the Province since 1867 is wanting, and the statement showing the cost of vaccination in each district was not ready to submit with the Report and has only now been received from the Sanitary Commissioner. It appears, moreover, that the figures in the statements furnished do not include the operations performed in the Western Circle in March 1882. Under these circumstances, no fair comparison of the work of the year under review with that of previous years is feasible. The total number of vaccinations given is 499,697, the percentage of success in primary operations being 95. The average cost of each operation was two annas.

15. From the reports submitted from the districts it appears that the Vaccination Department, as reorganized in 1881, has worked satisfactorily, and that the opposition of the people is rapidly diminishing. In many of the districts the Civil Surgeon has displayed great interest in the work, and the acknowledgments of Government are due to Surgeon Dennys, Dr. Quinnell, Mr. Connor and Chetan Shah, Rái Bahádur, for the systematic manner in which they carried on operations and the practical reports which they have furnished.

16. Surgeon O'Neill, Deputy Sanitary Commissioner of the Eastern Circle, devoted special attention to the storing and preservation of lymph, and has submitted a useful and practical paper on the subject.

17. Under the head of sanitary works it is satisfactory to observe that the Amritsar Municipality have undertaken radical measures for the improvement of the sanitary condition of the city, including projects for a pure water-supply and for intra and extra-mural drainage.

18. In Simla the scheme of sewerage suggested by Major Nisbet, Deputy Commissioner, is in progress. The new water-supply has proved a great boon to the inhabitants, but it is insufficient, and it is much to be regretted that so little progress has been made towards the completion of the second reservoir at Sanjauli.

19. The scheme for a new water-supply for Delhi is unfortunately still in abeyance.

20. The number of important and comprehensive projects on hand is small, but much has been done in the way of petty improvements which add much to the comfort and to a considerable degree also to the health of the people. Conservancy has been more systematically carried out; streets have been paved and provided with sufficient side drains; wells have been cleaned and kept in repair; about one-third of the income of the Municipalities being spent on works of this nature.

21. In pursuance of recent orders, the duties of Civil Surgeons as health officers of their districts have been more fully reorganized ; the work of superintending vaccination has also brought them more directly in contact with the people, and they have very generally taken advantage of the opportunities thus afforded them to urge upon the lambardárs and villagers the necessity for co-operation in efforts to remove sources of disease by which so many of the villages are surrounded.

22. The reports of the personal proceedings given in Section X. of the Report contain matters of much interest, and the following deserve special notice :—

23. The Report by the Sanitary Commissioner of his inspection of the town of Edwardes-abad ; the Report by Surgeon Major Bennett of his inspection of the town of Jullundur ; and the Report by Surgeon Dennys on the employment of Vaccinators as Sanitary Inspectors in the Karnál District.

ORDER.—Ordered, that the above remarks be printed and circulated for general information. Also that the Review be published in the *Punjab Government Gazette*.

Ordered also that copy be forwarded to the Sanitary Commissioner for information and explanation with regard to the incompleteness of the prescribed vaccination returns.

By order of the Hon'ble the Lieutenant-Governor,

W. M. YOUNG,

Secretary to Government, Punjab.

ERRATA.

Page 5, para. 5, opposite Belgium *for 2·0 read 32·0.*

Page 5, para. 8, line 16, *after "Jhang (33)" add "Jhelum (33)."*

Page 5, para. 9, line 4, *for 111·65 read 115·93.*

Page 6, para. 10, in Statement, column of total for 1882 *for 111·65 read 115·93.*

Page 6, para. 11, line 3, *for "was 48 and 40" read "was 28 and 20."*

Page 8, para. 15, *omit* population of Native Christians.

Annual Form No. II, page iii, in total of column 7, *for 111·65 read 115·93.*

Annual Form No. V, page ix, to note at foot of first half of Statement *add* "in which the population of Native Christians is included with that of all Christians, without any exception of any kind whatever," the ratios in column 5 under heading "Native Christians" should therefore be omitted.

Page 42 (Rohtak), line 11, *omit quotation commas before* "I quite agree * * * " *and insert them before* "Dr. Baron has exercised * * * ."

Page 42 (Sirsa), line 7, *insert quotation commas before* "The vigour of the lymph * * * " *and omit those before* "Another evil * * * " line 12.

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No Remarks.

SECTION II.—EUROPEAN ARMY.

No Remarks.

SECTION III.—NATIVE ARMY.

No Remarks.

SECTION IV.—JAILS.

No Remarks.

(These Sections are omitted from the Report, vide Government of India No. 9—258, dated 4th September 1878, to address of Secretary to Government, Punjab.)

SECTION V.—VITAL STATISTICS.

1. The population exhibited in the several statements attached to this report is based upon the enumeration of the Census of 1881, as taken from the several tables furnished to this office by the Deputy Superintendent of Census Operations, Punjab.

Population of 1881 compared with that of 1868.

The following is a comparison of the figures for the present and previous Census, according to sexes :—

			1868.	1881.
Males	...	...	9,595,434	10,210,053
Females	...	...	8,016,064	8,640,384
		TOTAL	17,611,498 *	18,850,437

It should be noted here that there is a difference between the population figures of 1868, as given above, and those shown in the Vital Statistical Statements; the difference is very slight, and the explanation is that, that much of the population not being under registration, it is consequently excluded from the returns of this Department. This discrepancy is now removed; for so far as I understand the whole of the Punjab population is now under registration. The Census figures of 1881 are therefore made use of in this year's report, exclusive, of course, of the population of the Khaibar Pass (8,173) which, as stated in last year's report, is not under registration.

Another point on which I have to remark is, that while the Military (Cantonment) population is included with the Provincial population, the births and deaths registered in that class are excluded from the statistical returns. In the statement given at page 6 of the Sanitary Report for last year, it will be seen that such was not the case. The reasons for the slight alteration in this year's statements are, (1) because it has been found on enquiry that the statistics of the recent Census do not comprise separate details of the Civil and Military population of each Cantonment; and, (2) because the Provincial birth and death-rates will not be affected in any marked degree by the addition of the military population, which varies in each year from between 200,000 to 250,000, to the total civil population.

2. No alterations have been made in the prescribed standard forms, except in Statement No. IV; the age periods have been altered in accordance with the instructions conveyed in Government of India Resolution No. 1—50-61, dated 4th March 1882. In statement No. VIB all the Cantonments in the Punjab are entered, instead of only the seven Frontier Cantonments, and this plan will be followed in future reports, unless otherwise directed.

The appendices attached to this report are the following :—

- A. Table showing the sickness and mortality among the children of the Lawrence Military Asylums, Sanawar and Murree.
- B. Do. do. among the Punjab Police Force.
- C. Do. do. in the selected villages of the Karnál and Delhi Districts, situate on the Western Jumna Canal.

3. Statement No. I shows that the total number of births registered in 1882 was 690,524, being at the rate of 36·65 to 1,000 persons living, as calculated on the recent population. In the two previous years the ratio was 31 and 40 respectively. From the following figures showing the male and female births registered in the Punjab during the years 1880, 1881 and 1882,

			1880.	1881.	1882.
Males	...	...	298,229	374,599	371,136
Females	...	...	246,430	321,167	319,388
		TOTAL	544,659	695,766	690,524

it will be seen that the births registered in the present year, as also the proportion of male to every 100 female births, are almost exactly the same as in the previous year. This proportion, however, viz., 116·20 varied greatly in different districts, being lowest in the Eastern, and highest in the Western Districts. In the Frontier Districts the rate was particularly high, viz., Dera Ismail Khan, 132; Dera Gházi Khan,

139 ; Bannu, 133 ; Pesháwar, 168 ; and Kohát, 143. The only inference that can be drawn from these figures is, that female births in this part of the Province cannot be registered as accurately as those of males.

Births registered by quarters. 4. The births registered in each quarter of the past and present year are given below :—

			1881.	1882.
1st Quarter	...	...	173,075	164,335
2nd „	...	...	129,293	129,479
3rd „	...	...	198,358	179,938
4th „	...	...	195,040	216,772

My remarks in the quarterly returns, which are submitted to Government for publication in the *Punjab Gazette*, will give all the information that is required under this head.

1st Quarter.—The total number of births registered in the Province numbered 164,335. Compared with the events of the corresponding quarter of the previous year, there is a decrease of 8,740 in the total number of births registered during the period under review. The decrease is most observable in the districts of Gurgáon, Hissar, Rohtak, Umballa, Ludhiána, Jullundur, Hoshiárpur, Amritsar, Gurdáspur, Lahore and Ferozepore. In the Frontier Districts of Dera Ismail Khan, Bannu, Pesháwar, Hazára, and Kohát, I notice with satisfaction an improvement in the system of birth registration, notably in the Districts of Hazára and Dera Ismail Khan. Of the registered births, 88,589 were males and 75,746 females ; in the corresponding quarter of the past year, the sexes were 92,747 and 80,328 respectively. In both quarters there were more boys born than girls. In 1881 the proportion stood thus, viz., 115 boys to 100 girls ; in the quarter under review there were 117 births registered of the former sex against 100 of the latter.

2nd Quarter.—The total births registered during the quarter under review were 129,479, or 69,808 males and 59,671 females, being in proportion of 117 males to 100 females. Compared with the events of the corresponding quarter of the previous year, there is an increase of only 186 in the total number of births registered during the period under review. In the first quarter of the current year the births amounted to 164,335, or 34,856 more than the second quarter. This considerable falling off need not be attributed so much to defective registration as to the influence of season ; for I find that in the second quarters of 1880 and 1881, also, there was a like falling off in the birth-rate.

3rd Quarter.—The total number of births registered during the quarter under review was 179,938, giving an annual birth-rate of 38 per 1,000 of population according to the recent Census of 1881. Compared with the results of the previous quarter, there is an increase of 50,459 births. There is, however, nothing exceptional in this rise in the provincial birth-rate, since in the corresponding quarter of the two previous years also there was a like increase. Thus, in 1880—the first year of the introduction of birth registration in the Punjab—the increase of births registered in the third quarter as compared with those registered in the previous quarter of that year, was 47,469 ; in the third quarter of 1881, in like manner, the excess of births was by 69,065. It is evident from these figures that a considerable rise in the birth-rate of the Province during the third quarter of the year is the normal course representative of the fecundity of its population during the different seasons. Of the total of 179,938 births registered, there were 96,883 male and 83,055 female, or in the proportion of 117 male to 100 female births. The same proportion also was observed in the returns of the two previous quarters.

4th Quarter.—The total births registered during the quarter under review amounted to 216,772, of which number 115,856 were males and 100,916 females, and were considerably above the numbers registered in each of the corresponding quarters of the two preceding years—as also of the three preceding quarters of the present year. The birth-rate, which has been calculated on the figures of the recent Census, is 46, which is the highest yet recorded since the introduction of birth registration in 1880. This marked increase in the number of births may be attributed partly to the healthiness of the season, partly to the low prices of food, and more so to accurate registration.

5. The proportions of registered births to the total population in the Urban and Rural Birth registration in the Urban populations of the Punjab, during the four quarters of the year 1881 and Rural districts. and 1882, are given in the margin ; they indicate the regularity in the

Birth-rate amongst the Urban and Rural populations.				
	1881.		1882.	
	Urban.	Rural.	Urban.	Rural.
1st Quarter ...	36	40	32	35
2nd „ ...	30	29	24	23
3rd „ ...	48	45	40	38
4th „ ...	44	45	49	46
For the year ...	39·5	39·7	36·4	36·7

for the past and present years :—

rise and fall of the birth-rates in each quarter also. The rates, however, vary very greatly in the different towns and villages, as will be seen from the following table showing the urban and rural rate of each district, by quarters,

Statement showing the Birth-rate in the Urban and Rural populations of the Punjab Province, by Quarters, during the years 1881 and 1882.

DISTRICTS.	Urban and Rural.	Population.	1881.				1882.			
			1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
Delhi	Urban	200,569	47	47	61	59	40	35	48	57
	Rural	442,946	39	33	58	55	34	25	43	52
Gurgaon	Urban	70,099	41	40	55	46	35	24	42	52
	Rural	571,749	37	26	50	43	32	22	40	48
Karnál	Urban	74,161	33	25	43	41	30	25	30	44
	Rural	548,460	39	30	55	51	39	35	45	50
Hissar	Urban	70,944	23	28	47	43	26	21	41	53
	Rural	433,239	39	32	46	45	30	25	44	51
Rohtak	Urban	55,306	37	34	49	46	31	26	36	48
	Rural	498,303	40	33	58	58	33	26	47	52
Sirsa	Urban	30,963	31	25	38	30	19	10	23	36
	Rural	222,312	43	31	44	43	25	24	43	53
Umballa	Urban	99,646	33	25	43	39	29	24	37	40
	Rural	967,617	41	28	40	42	34	25	31	39
Ludhiána	Urban	83,052	44	32	55	50	35	29	44	57
	Rural	535,783	45	30	43	43	35	28	37	47
Simla	Urban	12,305	4	6	4	3	8	3	9	4
	Rural	30,640	31	23	29	29	14	13	10	16
Jullundur	Urban	109,311	36	25	43	39	39	23	41	57
	Rural	680,244	52	32	47	44	42	29	37	50
Hoshiárpur	Urban	68,698	41	26	48	46	39	26	41	53
	Rural	832,683	47	31	47	47	41	28	35	47
Kángra	Urban	22,876	25	20	29	33	34	27	24	38
	Rural	767,969	25	23	28	32	33	29	25	33
Amritsar	Urban	176,370	39	31	54	34	24	13	24	56
	Rural	716,896	51	34	55	56	42	26	37	58
Gurdáspur	Urban	79,143	33	24	49	40	36	21	35	53
	Rural	744,552	43	29	51	50	43	27	39	59
Sialkot	Urban	72,078	35	25	50	44	34	29	45	54
	Rural	940,070	46	30	51	49	45	30	43	62
Lahore	Urban	183,771	33	24	42	39	26	15	32	45
	Rural	740,335	55	38	58	61	41	28	38	58
Gujránwála	Urban	71,994	33	27	49	41	32	27	45	47
	Rural	544,898	42	31	51	54	40	33	46	57
Ferozepore	Urban	35,152	43	35	52	48	34	21	40	53
	Rural	615,367	46	32	49	45	30	24	44	51
Rawalpindi	Urban	52,675	32	25	35	47	36	28	44	41
	Rural	767,837	41	31	39	44	37	31	36	34
Jhelum	Urban	44,990	28	24	38	40	26	22	34	31
	Rural	544,383	37	31	47	44	31	27	40	34
Gujrát	Urban	42,396	38	39	58	56	40	36	57	53
	Rural	646,719	43	33	49	43	37	35	48	49
Shahpur	Urban	51,631	45	44	72	64	37	44	72	55
	Rural	369,877	32	31	47	47	31	35	48	44
Mooltan	Urban	76,880	42	37	59	55	34	25	52	57
	Rural	475,084	36	27	39	41	26	22	32	43
Jhang	Urban	36,981	33	30	48	46	34	39	60	63
	Rural	358,315	34	23	40	43	36	34	48	48
Montgomery	Urban	23,589	33	30	43	52	28	25	43	49
	Rural	402,940	40	31	43	42	29	26	33	45
Muzaffargarh	Urban	17,503	36	38	55	46	36	22	57	56
	Rural	321,102	47	40	53	51	41	32	48	44
Dera Ismail Khan	Urban	42,342	26	23	37	35	25	22	44	30
	Rural	399,307	23	23	35	35	29	27	37	29
Dera Gházi Khan	Urban	37,616	28	27	40	39	22	17	37	39
	Rural	325,730	25	19	31	25	20	17	26	18
Bannu	Urban	22,076	29	26	44	48	31	30	43	48
	Rural	310,501	21	16	29	36	25	27	36	35
Pesháwar	Urban	60,425	37	30	32	44	36	23	26	36
	Rural	532,249	20	14	14	17	21	16	17	16
Hazára	Urban	16,409	27	30	39	31	47	30	33	32
	Rural	390,666	34	32	25	29	45	39	31	37
Kohát	Urban	13,490	22	24	32	31	42	22	43	39
	Rural	168,050	18	16	21	25	21	18	23	21
PROVINCE	Urban	2,055,441	36	30	48	44	32	24	40	49
	Rural	16,786,823	40	29	45	45	35	28	38	46

An examination of the figures in this table shows how remarkably high the rate is in some towns and villages, and how very low it is in others. For instance, the urban and rural rate of Delhi for the four quarters varies from 25 to 57 ; that of Pesháwar from between 16 to 36 ; the urban and rural rates of Sialkot in the last quarter of 1882 are 54 and 62 respectively ; those of Jhelum only 31 and 34 in the same period. These variations seem curious, and we may assume therefore that there must be some local conditions,

climatic or other, which effect the fecundity of women, and thus cause higher birth-rates in some parts than in others; or it may be that the proportion of women of productive ages are greater in some districts than in others. The Census Report, which has not yet been received in this office, will doubtless explain the real causes for this strange distribution as disclosed by the above statement.

The highest birth-rate occurred in the Districts of Siálkot (44·73) Gujránwála (43·38), Gujrá (42·48), Jhang (42·36), Gurdáspur (41·66), Shahpur (41·02), Muzaffargarh (41·33); the lowest, excluding the Hill Station of Simla, in Pesháwar (18·91), Dera Gházi Khan (21·37), Kohát (21·71).

5. The birth-rate of the Punjab Province, for the year 1882, compares very favorably with that of European countries. The following table (*vide* Registrar-General's Annual Report of Births, Deaths and Marriages in England for 1880, page 15) is subjoined for this purpose:—

Mean Annual Birth-rate.			Mean Annual Birth-rate.		
1876-80.			1876-80.		
England and Wales	...	35·4	Switzerland	...	31·3
Denmark	...	31·9	German Empire	...	39·3
Sweden	...	30·2	The Netherlands	...	36·4
Austria	...	39·1	Belgium	...	2·0
Hungary	...	43·6	Italy	...	36·6
		Punjab	...		36·42

6. On the whole I am quite satisfied with the progress that has been made in the system of birth registration during the past three years, and feel sure that under the new rules of supervision and direction the system will be still further popularized.

7. The deaths in 1882 amounted to 504,799, of which number 271,018 were males and 233,781 females. The Provincial death-rate is 27, and that of the sexes 26 and 27 respectively. In the margin are given the death-rates of the Punjab Province since 1868 to 1881, as calculated on the previous Census, with a view to shew the fluctuations in the death-rates of each year, and also to shew the healthy from the unhealthy years since the introduction of civil registration in this Province.

Excluding the year 1868—the figures of which are unreliable,—the year 1874 was the healthiest in the period of 14 years, next 1873 and 1877, then 1871 and 1870, and last 1875 and 1880.

8. The year under review may be said to be a fairly healthy year also, although the total deaths are less by only 14,980 than those registered in the previous year which was unhealthy. The table in the margin shows that the deaths from cholera in 1882 are less by 5,168 than in 1881; from small-pox by 370; from fevers by 8,599; from bowel-complaints by 1,321; but from "all other causes" they are in excess by 478. With the exception of the districts in the Rawalpindi, Mooltan, and Derajat Divisions, there has been no epidemic prevalence of disease in any other part of the Province, so that I feel tempted to attribute this result to more accurate registration than to any other cause.

	Cholera.	Small-pox.	Fevers.	Bowel-complaints.	All other causes.	Total.
1881	5,207	6,749	355,279	17,281	135,263	519,779
1882	39	6,379	346,680	15,960	135,741	504,799
Decrease,	5,168	370	8,599	1,321	— 478	14,980

Further, on glancing at column 8 of Annual Form No. II, showing the ratio of deaths per 1,000 of population, it will be seen that, with the exception of the Districts of Pesháwar, Kohát and the Simla Sanitarium, the remaining 29 districts have a death-rate of over 20 per mille.

In some districts it is high, *viz.*, Muzaffargarh (45), Shahpur (40), Mooltan (36), Jhang (33), but in all the others it ranges between 20 and 31; so that applying the test of the English standard to these figures, the result is satisfactory.

9. The death ratio of males was as usual higher than that of females, in every district of the Province, more particularly so in the districts of the Delhi, Hissár and Pesháwar Divisions. For the Province the return for 1882 shows that there were 111·65 deaths of males to every 100 females. In the five preceding years the ratio was as follows:—

1877	...	...	...	...	123
1878	...	...	...	...	121
1879	...	...	...	...	125
1880	...	...	...	...	124
1881	...	...	...	...	116

10. The following statement is of considerable interest, inasmuch as it shows by districts the relative proportion of boys born to every 100 girls, as also the ratio of male to 100 female deaths for the years 1880-82 :—

Number.	DISTRICTS.	NUMBER OF MALES BORN TO EVERY 100 FEMALES BORN.			NUMBER OF MALES DIED TO EVERY 100 FEMALES DIED.		
		1880.	1881.	1882.	1880.	1881.	1882.
1	Delhi	117.60	115.60	113.18	125.73	117.80	117.93
2	Gurgaon	139.78	117.71	116.46	137.14	117.34	120.75
3	Karnál	122.15	118.91	113.88	131.10	124.67	123.11
4	Hissar	125.24	116.31	117.14	130.40	123.42	122.18
5	Rohtak	121.39	114.51	116.93	142.17	128.49	122.95
6	Sirsa	124.34	117.72	120.34	128.89	115.02	127.48
7	Umballa	121.96	116.01	117.78	130.41	118.27	118.23
8	Ludhiana	118.76	116.05	114.09	117.65	114.88	113.31
9	Simla	141.46	116.26	125.82	131.69	173.31	143.77
10	Jullundur	113.65	108.76	112.52	118.92	106.91	109.60
11	Hoshiárpur	113.51	111.06	111.03	116.13	110.19	113.97
12	Kángra	113.48	111.43	108.58	115.78	113.73	116.83
13	Amritsar	115.08	112.84	114.15	117.93	106.01	115.02
14	Gurdaspur	115.58	113.04	113.12	118.86	108.77	122.70
15	Siálkot	118.09	114.81	115.22	123.97	114.94	120.17
16	Lahore	117.26	116.30	114.03	124.85	116.06	115.89
17	Gujranwala	118.88	117.39	114.62	118.29	115.25	117.63
18	Ferozepore	117.89	114.96	116.05	129.14	109.50	120.34
19	Rawalpindi	126.14	121.78	115.11	129.38	123.62	108.15
20	Jhelum	119.44	113.63	115.57	122.28	114.38	104.91
21	Gujrat	120.38	115.32	113.18	119.83	115.69	113.42
22	Shahpur	118.28	110.60	114.92	115.50	120.88	105.14
23	Mooltan	125.20	120.26	116.12	126.46	119.98	118.76
24	Jhang	123.08	116.52	113.90	135.55	115.67	108.88
25	Montgomery	114.97	114.60	116.64	123.80	117.25	120.23
26	Muzaffargarh	128.65	113.58	110.66	121.86	119.39	104.05
27	Dera Ismail Khan	143.33	130.46	132.96	123.85	125.87	115.69
28	Dera Ghazi Khan	139.99	139.13	139.07	139.44	126.80	124.92
29	Bannu	150.10	138.76	133.37	128.39	132.43	116.53
30	Pesháwar	181.90	175.89	168.49	132.58	124.01	127.84
31	Hazára	134.78	128.13	118.85	123.58	121.82	110.17
32	Kohát	178.43	153.60	143.78	150.67	138.19	122.70
TOTAL ...		121.02	116.64	116.20	124.52	116.12	111.65

Taking the Province as a whole, these ratios reveal the curious fact that the proportion of boys born to every 100 girls, and that of male to female deaths, is nearly on a par with each other in each year. In 1880 the ratio was 121.02 male births to 124.52 male deaths; in 1881, 116.64 to 116.12; and in 1882, 116.20 to 111.65.

11. The death-rates of the urban and rural population, which, according to the recent Census, is 2,055,441 and 16,786,823 respectively, was 48 and 40.

In point of healthiness the rural districts are far in advance of the urban.

The death-rates by quarters, in 1882, for these classes of the population are compared below with 1881 :—

	1881.				1882.			
	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
Urban	28	27	48	65	27	28	30	48
Rural	26	21	23	42	20	20	23	40

Birth and death registration in the principal towns.

12. The following statement shows the result of birth and death registration in the 49 principal towns of the Province.

Comparative Statement of Births and Deaths registered in the 49 large Municipal towns in the Punjab and their Birth and Death-rates during the year 1882.

Number.	DISTRICTS.	TOWNS.	Population.	BIRTHS.			DEATHS.			BIRTH-RATES.			DEATH-RATES.		
				Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1	Delhi	Delhi	117,363	2,923	2,804	5,727	2,913	2,705	5,618	25	24	49	47	49	48
2		Do. Suburbs	52,882	1,160	992	2,152	805	666	1,471	22	19	41	28	28	28
3		Sonepat	13,077	323	213	536	195	152	347	25	16	41	30	23	26
4	Gurgaon	Rewari	24,445	502	498	1,000	334	328	662	20	20	41	27	27	27
5		Palwal	10,635	268	245	513	250	204	454	25	23	48	47	38	43
6		Karnal	23,133	380	320	700	463	380	843	16	14	30	37	36	36
7	Karnál	Kaithal	14,754	166	132	298	156	111	267	11	9	20	21	15	18
8		Pánipat	26,572	545	441	986	466	404	870	20	16	37	35	30	33
9		Hissar	14,167	260	214	474	290	212	502	18	15	33	37	33	35
10	Hissar	Hánsi	12,656	226	169	395	166	175	341	18	13	31	25	29	27
11		Bhiwáni	33,762	765	647	1,412	490	409	899	23	19	42	28	25	27
12		Rohtak	15,699	221	170	391	263	214	477	14	11	25	32	28	30
13	Rohtak	Jhajjar	11,650	287	255	542	207	207	414	25	22	46	36	35	35
14		Sirsa	12,292	123	79	202	149	104	253	10	6	16	22	19	20
15		Umballa	26,777	601	558	1,159	476	416	892	22	21	43	33	34	33
16	Umballa	Jagádhri	12,300	194	181	375	170	148	318	16	15	30	26	25	26
17		Shahabad	10,218	174	151	325	120	107	227	17	15	32	23	21	22
18		Sádhaúra	10,794	170	153	323	148	130	278	16	14	30	27	25	26
19	Ludhiána	Rúpar	10,326	174	134	308	108	96	204	17	13	30	17	23	20
20		Ludhiána	44,163	937	848	1,785	674	589	1,263	21	19	40	27	30	28
21		Jagraon	16,873	433	376	809	292	257	549	26	22	48	33	32	32
22	Jullundur	Jullundur	31,177	742	685	1,427	471	402	873	24	22	46	28	28	28
23		Do. Suburbs	11,474	296	271	567	125	119	244	26	24	49	21	22	21
24		Rahon	11,736	183	176	359	160	148	308	15	15	30	26	26	26
25	Hoshiárpur	Hoshiárpur	13,263	273	252	525	184	165	349	20	19	39	26	27	26
26		Tánda and Urmár	10,293	222	235	457	207	176	383	21	23	44	38	36	37
27		Amritsar	144,216	2,299	2,061	4,360	3,162	2,754	5,916	16	14	30	39	44	41
28	Gurdáspur	Batála	24,281	480	452	932	320	329	649	20	19	38	26	27	27
29		Siálkot	33,850	687	579	1,266	452	388	840	20	17	37	25	24	25
30		Lahore	97,208	1,631	1,271	2,902	1,607	1,495	3,102	17	13	30	30	34	32
31	Lahore	Do. Suburbs	41,670	299	295	594	638	377	1,015	7	7	14	24	25	24
32		Kasur	17,336	344	310	654	198	180	378	20	18	38	22	21	22
33		Gujránwála	22,884	471	451	922	288	274	562	20	20	40	23	26	24
34	Ferozepore	Wazirabad	16,462	276	244	520	163	134	297	17	15	31	18	17	18
35		Ferozepore	20,870	356	312	668	325	203	528	17	15	32	27	23	25
36		Rawalpindi	26,785	489	451	940	633	535	1,168	18	17	35	36	56	44
37	Jhelum	Jhelum	16,634	135	125	260	160	132	292	8	7	16	14	25	17
38		Pind Dádan Khan	16,724	357	371	728	426	489	915	21	22	43	47	63	55
39		Gujrát	18,743	433	411	844	196	180	376	23	22	45	20	20	20
40	Shahpur	Jalálpur	12,839	296	282	578	250	221	471	23	22	45	37	36	37
41		Bhera	15,165	485	425	910	529	631	1,160	32	28	60	69	84	76
42		Mooltan	31,878	727	677	1,404	659	635	1,294	23	21	44	39	42	40
43	Jhang	Do. Suburbs	25,593	524	508	1,032	660	615	1,275	20	20	40	46	55	50
44		Maghiána	12,574	320	281	601	214	211	425	25	22	48	32	35	34
45		Chiniot	10,731	308	290	598	205	185	390	29	27	56	39	34	36
46	D. I. Khan	Dera Ismail Khan	18,988	317	210	527	476	376	852	17	11	28	46	43	45
47		D. G. Khan	19,687	314	222	536	338	315	653	16	11	27	31	36	33
48		Pesháwar	59,292	968	825	1,793	1,011	731	1,742	16	14	30	30	28	29
49	Kohát	Kohát	13,490	258	188	446	170	146	316	19	14	33	21	26	23
GRAND TOTAL			1,310,383	25,322	22,440	47,762	23,362	20,560	43,922	19	17	36	33	34	33

Deaths by months in 1881 and 1882.

13. The deaths registered in the Punjab during each month of the years 1881-82 are as below:—

Years.	Jany.	Feby.	March.	April.	May.	June.	July.	August.	Septr.	October.	Novr.	Deer.
1881	42,501	37,716	33,872	32,138	32,600	31,662	28,838	31,476	53,921	75,318	64,515	55,222
1882	40,023	29,308	30,644	28,908	34,700	33,744	29,376	35,032	48,160	58,319	67,495	69,090

The above figures, as well as those of the past 14 years, clearly prove that April, May and June are the healthiest; and October, November and December the unhealthiest months in this Province.

14. The classification of deaths in 1882 having been changed with a view that the Vital Statistical returns shall correspond with the age periods of the recent Census, no correct comparison can be made between the figures of the present and those of the past year. The figures in the margin shew the total deaths by sexes under the different ages, as also the ratio per 1,000 living, calculated on the population of each age period during 1882; they show also how terribly the infantile population suffered in comparison with the other periods of life. The mortality in 1881 can, however, be compared with that of 1882, for the following age periods :—

Deaths by age.	TOTAL.		RATIO PER 1,000.	
	Males.	Females.	Males.	Females.
Under 1 year	... 77,261	67,051	238·56	217·97
1 to 5	... 48,061	43,977	51·14	49·41
5 to 10	... 12,979	11,152	9·13	9·31
10 to 15	... 6,911	5,779	5·56	6·29
15 to 20	... 5,594	5,098	6·17	6·89
20 to 30	... 15,617	16,212	9·03	10·51
30 to 40	... 16,512	15,573	11·98	13·33
40 to 50	... 20,830	15,980	20·73	18·46
50 to 60	... 20,992	14,664	31·60	28·12
60 and upward.	... 46,261	38,295	78·27	78·46

	1881.		1882.	
	Males.	Females.	Males.	Females.
20 to 30	17,881	18,383	15,617	16,212
30 to 40	18,308	16,742	16,512	15,573
40 to 50	22,580	16,803	20,830	15,980
50 to 60	22,481	15,230	20,992	14,664
60 and upward.	46,874	38,623	46,261	38,295

These figures indicate how very closely the mortality in 1882, in these age periods, corresponds with that of 1881.

15. I am now able to give, for the first time since the organization of this Department in 1868, the information required in the Annual Standard Form No. V, viz., the population and the deaths registered according to classes in the districts of the Punjab Province. The population (which has been taken from the Preliminary Census returns) and the deaths according to classes in 1882 are as follows :—

	Population.	Deaths.	Death-rate.
Muhammadans	10,522,802	286,315	27·21
Hindus	8,288,575	177,029	21·37
Native Christians	32,500	37	1·14
Other castes	3,387	41,418	...
TOTAL	18,842,264	504,799	26·79

The death-rates of "other castes" are omitted, as it will be seen on reference to Annual Statement No. V, that in the majority of districts the deaths registered among "other castes" are in excess of the population. This error is due to the local Registrars who classify deaths among Muhammadan and Hindu sweepers, and other low castes as "other castes." This error will be rectified in the current year.

16. The result of registration in the selected villages of the Delhi and Karnál Districts, situate on the Western Jumna Canal, will be found in Appendix C, as also a short report on the unhealthiness of certain canal villages in the Ferozepore District, by Dr. Doyle, Deputy Sanitary Commissioner, Western Circle.

17. Birth and death returns of Europeans and Eurasians are now received regularly in this office from all the districts of the Province, except Gurgaon, Siálkot and Dera Gházi Khan,* through local Registrars and Police Officers. The births registered, as well as the mortality from different causes, age, and sex, in this class of the population are exhibited in the three following tables :—

* These returns are now submitted from this District.

Statement showing the number of Births registered among the European and Eurasian population of the Punjab during the year 1882.

Number.	DISTRICTS.				Population of 1881.	BIRTHS.			REMARKS.
						Males.	Females.	Total.	
1	Delhi	...	...	...	1,103	4	1	5	
2	Gurgaon	...	...	...	44	Returns	not received.		
3	Karnál	...	...	...	37	...	...	...
4	Hissar	...	...	...	49	3	...	3	
5	Rohtak	...	...	...	17	...	...	...
6	Sirsa	...	...	...	17	2	...	2	
7	Umballa	...	...	...	3,549	...	...	...
8	Ludhiána	...	...	...	143	...	...	...
9	Simla	...	...	...	3,143	24	33	57	
10	Jullundur	...	...	...	1,565	2	...	2	
11	Hoshiárpur	...	...	...	33	1	...	1	
12	Kangra	...	...	...	210	...	1	1	
13	Amritsar	...	...	...	628	1	2	3	
14	Gurdáspur	...	...	...	306	...	3	8	
15	Sialkot	...	...	...	1,282	Returns	not received.		
16	Lahore	...	...	...	3,884	3	3	6	
17	Gujránwála	...	...	...	113	1	3	4	
18	Ferozepore	...	...	...	1,590	...	...	...
19	Rawalpindi	...	...	...	3,712	...	...	...
20	Jhelum	...	...	...	368	...	1	1	
21	Gujrát	...	...	...	236	...	1	1	
22	Shahpur	...	...	...	26	...	...	...
23	Mooltan	...	...	...	1,819	3	3	6	
24	Jhang	...	...	...	11	...	...	...
25	Montgomery	...	...	...	73	...	...	...
26	Muzaffargarh	...	...	...	28	...	...	...
27	Dera Ismail Khan	...	...	...	251	1	...	1	
28	Dera Gházi Khan	...	...	...	70	Returns	not received.		
29	Bannu	...	...	...	61	...	...	...
30	Pesháwar	...	...	...	4,018	...	...	...
31	Hazára	...	...	...	84	1	...	1	
32	Kohát	...	...	...	207	...	...	...
TOTAL					28,677	46	56	102	Birth-rate 3.56

RETURN A.

Deaths registered from different causes among the European and Eurasian Population in the Districts of the Punjab during the year 1882.

1	2	3	4	5	6	7	8	9	10	11	12	13	14											
No.	DISTRICTS.	Population according to Census, 1881.	CLASS Euro- pean and Eura- sian.	CAUSES OF DEATH.																		Total deaths from all causes.		
				Cholera.	SMALL-POX.						Fever.	Bowel com- plaints.	INJURIES.								All other causes.			
					Under one year.	1-12.		12 and over 12.		Suicide.			Wound- ing.		Acci- dent.		Snake-bite or killed by wild beasts.							
						Males.	Females.	Males.	Females.				Males.	Females.	Males.	Females.	Males.	Females.						
																			Total.	Males.			Females.	Total.
1	Delhi	1,103	3	..	..	..	..	..	..	..	..	..	..	..	1	1	2	2	1	3			
2	Gurgaon	44	..	..	Returns	not received	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	Karnál	37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	Hissar	49	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2			
5	Rohtak	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	Sirsa	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	Umballa	3,549	1	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..
8	Ludhiana	143	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1			
9	Simla	3,143	24	..	..	..	..	..	2	2	1	1	2	..	..	..	8	12	20	11	13	24	
10	Jullundur	1,565	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	1	
11	Hoshiárpur	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	Kangra	210	1	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	1	
13	Amritsar	628	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	3	4	7	
14	Gurdáspur	306	4	..	Returns	not received	..	..	..	..	..	..	..	..	..	..	1	3	4	1	3	4	
15	Sialkot	1,282	..	..	Returns	not received	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	Lahore	3,884	35	9	3	12	3	2	5	1	1	10	7	17	23	35
17	Gujránwála	113	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	3	1	2	3	3
18	Ferozepore	1,590	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	Rawalpindi	3,712	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	2	..	..	2
20	Jhelum	368	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..	1
21	Gujrát	236	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	Shahpur	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	Mooltan	1,819	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2	1	1	2	2
24	Jhang	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	Montgomery	73	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	Muzaffargarh	28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	Dera Ismail Khan	251	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	Dera Gházi Khan	70	..	..	Returns	not received	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	Bannu	61	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	Pesháwar	4,018	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	Hazára	84	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
32	Kohát	207	1	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..	1
TOTAL		28,677	86	12	3	18	4	3	7	88
Ratio per 1,000 of popu- lation	0.52	..	0.24	2.16	..	3

RETURN B.

Deaths registered according to age during the year 1882.

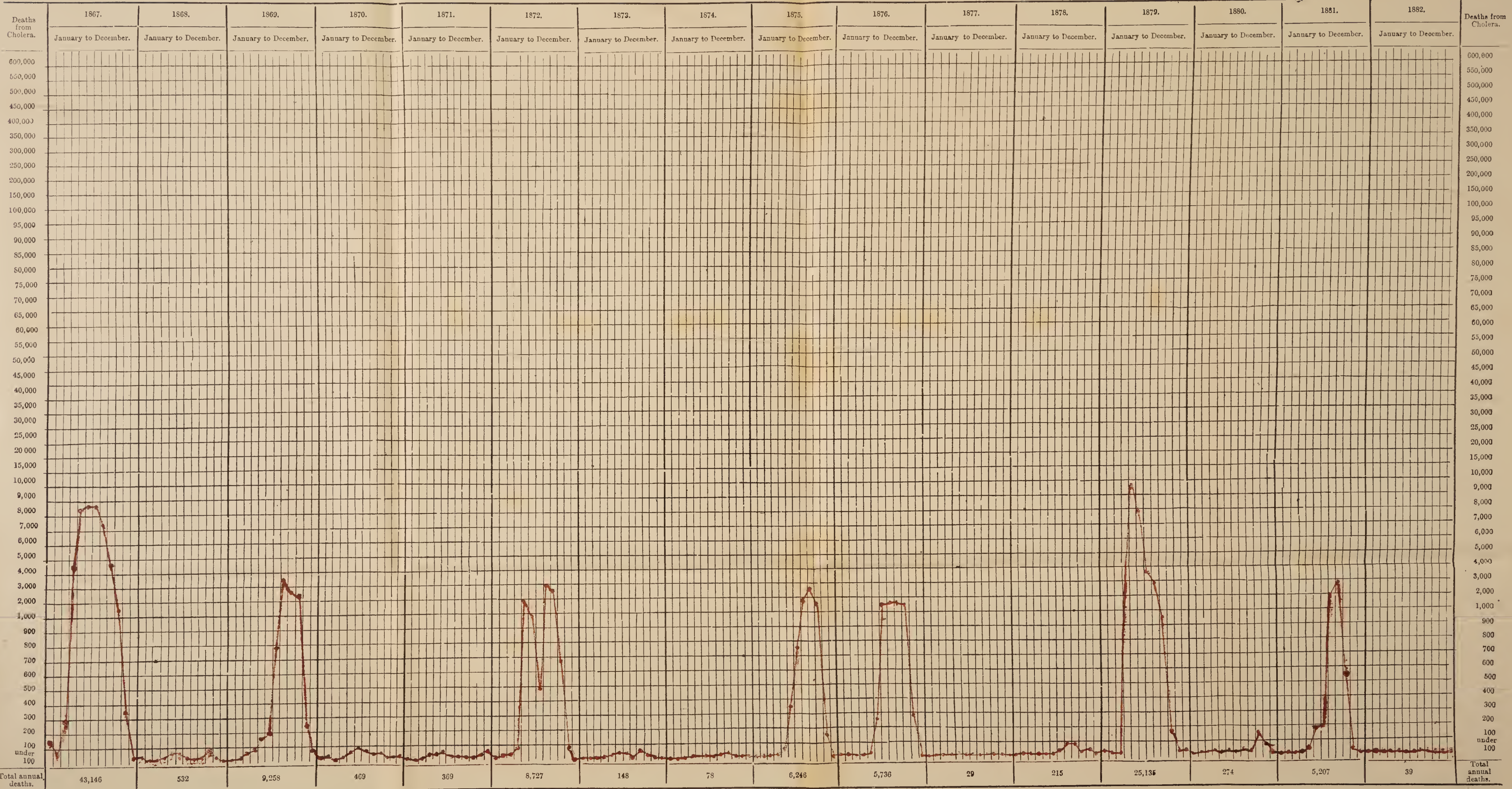
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15													
Number.	DISTRICTS.	BORN DEAD:		CLASSES OF BORN DEAD.		AGES AT DEATH.										TOTAL.											
		Males.	Females.	European & Eurasian.	Under one year.	1—5		5—10		10—15		15—20		20—30		30—40		40—50		50—60		60 and upwards.					
						Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.				
1	Delhi	...	...	...	...	1	...	...	...	...	...	...	...	2	1									
2	Gurgaon	...	...	...	...	Returns not received.										...	...								
3	Karnal	...	...	...	...	...	...	...	...	...	...	...	...	2	...									
4	Hissar	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Rohtak	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	Sirsa	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Umballa	...	...	...	...	...	...	...	...	...	...	...	...	1	...									
8	Ludhiāna	...	...	...	...	...	...	...	...	...	...	...	...	1	...									
9	Simla	2	1	3	4	3	1	1	...	2	...	2	2	1	1	1	...	1	...	1	1	2	11	13			
10	Jullundur	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...
11	Hoshiārpur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	Kāngra	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...
13	Amritsar	...	...	...	...	1	...	...	...	...	...	...	...	1	...	2	3	...	...	...	...	...	3	4
14	Gurdaspur	1	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	2	...	...	1	3
15	Siākot	...	...	...	...	Returns not received.										...	...								
16	Lahore	6	4	1	1	...	1	2	...	5	2	5	2	2	2	1	...	1	...	23	12	
17	Gujrānwāla	1	1	1	1	2		
18	Ferozepore	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	Rawalpindi	1	2	...		
20	Jhelum	1	1	...		
21	Gujrat	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Shahpur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	Mooltan	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	1
24	Jhang	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	Montgomery	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	Muzaffargarh	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	Dera I. K.	...	...	...	...	Returns not received.										...	...								
28	Dera G. K.	...	...	...	...	Ditto.										...	...								
29	Bannu	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	Peshāwar	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	Hazāra	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	Kohāt	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...
TOTAL		...	3	1	4	12	10	3	1	...	3	...	3	4	1	11	5	9	6	8	2	2	4	2	2	51	37

18. The fines imposed during the year amounted to Rs. 217/10* for neglect to register births and deaths in Municipal towns. In the two preceding years they were Rs. 280 and 822, respectively.

19. I cannot conclude this section of my report, without recording my satisfaction at the creditable Birth and Death returns transmitted with regularity and punctual manner in which the Birth and Death returns are compiled and transmitted to this office by the Police Authorities, in the several Rural Circles of the Punjab Province.

* Returns of 26 districts only received up to 4th April 1883.

CHART SHOWING DEATHS FROM CHOLERA BY MONTHS IN THE PUNJAB PROVINCE, DURING THE YEARS 1867 TO 1882.



SECTION VI.—CHIEF DISEASES OF THE YEAR.

A. CHOLERA.

20. A notable feature in regard to the healthiness of the Province is the absolute quiescence of the cholera during the year under review. Thirty-nine isolated deaths are reported to have occurred in different parts of the province from this disease. The absolute quiescence of the disease during the year. The usual further enquiry and investigation elicited the reports shown in the subjoined tabular statement :

Statement showing the reputed cause of death in 39 cases registered under the head of Cholera during 1882, after special enquiry.

Number.	District.	Police Station.	Town or Village.	DEATHS.			Age.	Duration of illness.	Date of death.	Disease to which death is attributed by district authorities.
				Male.	Female.	Total.				
1	Delhi	Pahārganj	Delhi	1	1	1	10 years,	5 hours..	27th January	Cholera.
2	Do.	Do.	Do.	1	1	1	60 "	8 days ..	28th "	Do.
3	Do.	Do.	Suburbs	1	1	1	5 "	3 ..	25th "	Do.
4	Do.	Do.	Do.	1	1	1	7 "	5 hours..	4th August	Fever.
5	Do.	Do.	Delhi	1	1	1	15 "	12 ..	8th September	Cholera.
6	Do.	Do.	Suburbs	1	1	1	22 "	13 ..	9th "	Do.
7	Karnāl	Batana	Dabarthala	1	1	1	22 "	3 days ..	2nd March	Fever.
8	Do.	Karnāl	Salāru	1	1	1	12 "	1 day ..	30th "	Do.
9	Do.	Do.	Karnāl	1	1	1	45 "	1 ..	19th July	Cholera.
10	Rohtak	Jhajjar	Jhajjar	1	1	1	7 "	1 ..	12th February	Fever.
11	Do.	Do.	Do.	1	1	1	25 "	2 days ..	26th "	Do.
12	Umballa	Shahabad	Ismailabad	1	1	1	29 "	1 day ..	9th April	Pain in stomach.
13	Do.	Thanesar	Thanesar	1	1	1	20 "	2 days ..	15th "	Vomiting and purging.
14	Do.	Jagādhrī	Jagadhri	1	1	1	20 "	2 ..	5th May	Do.
15	Do.	Do.	Do.	1	1	1	45 "	3 ..	10th "	Do.
16	Do.	Do.	Bhatli	1	1	1	35 "	1 day ..	20th "	Pain in stomach.
17	Do.	Kharar	Kharar	1	1	1	15 "	1 ..	28th December	Diarrhoea.
18	Ludhiāna	Machiwara	Machiwara	1	1	1	25 "	1 ..	16th May	Vomiting, purging, and pain in stomach.
19	Do.	Sanawal	Pangallian	1	1	1	30 "	4 days ..	12th February	Fever.
20	Hoshiārpur	Hoshiārpur	Hoshiārpur	1	1	1	30 "	13 ..	7th "	Vomiting, purging, and pain in stomach.
21	Amritsar	Lopoki	Gohala	1	1	1	20 "	5 hours..	28th May	Pain in stomach and its swelling.
22	Do.	Jaudiala	Mehman	1	1	1	22 "	2 days ..	28th August	Fever.
23	Gurdāspur	Diwānagar	Talwandi	1	1	1	30 "	3 ..	7th May	Fever and Diarrhoea.
24	Do.	Batala	Dala	1	1	1	35 "	1 hour ..	5th February	Indigestion.
25	Do.	Kot Naina	Sukhuehak	1	1	1	40 "	1 day ..	3rd August	Pain in stomach.
26	Do.	Do.	Kot Naina	1	1	1	2 "	4 days ..	30th April	Dysentery.
27	Lahore	Khudian	Khudian	1	1	1	4 "	4 hours..	27th August	Vomiting.
28	Do.	Do.	Do.	1	1	1	5 "	3 ..	29th "	Vomiting and purging.
29	Do.	Lahore	Lahore	1	1	1	22 "	1 day ..	22nd November	Swelling of the stomach.
30	Gujrānwāla	Hafazabad	Kot Mian Khan	1	1	1	1 year,	7 days ..	10th September	Fever.
31	Ferozepore	Muktsar	Muktsar	1	1	1	26 years,	1 day ..	26th "	Do.
32	Rawalpindi	Gujar Khan	Baghpur	1	1	1	40 "	1 ..	9th June	Vomiting and purging.
33	Jhelum	Jalalpur	Chakri Duman	1	1	1	20 "	1 ..	22nd "	Pain in stomach.
34	Do.	Chakwal	Jabarpur	1	1	1	22 "	2 days ..	2nd July	Vomiting and purging.
35	Do.	Dina	Pandori	1	1	1	20 "	Not known	2nd "	Do.
36	Muzaffargarh	Rohailianwāli	Jalwan	1	1	1	70 "	20 days ..	7th August	Costiveness and stop of Urine.
37	Bannu	Edwardesabad	Edwardesabad	1	1	1	10 "	1 day ..	4th October	Vomiting and purging.
38	Do.	Lakimurat	Charkhel	1	1	1	8 "	1 ..	7th "	Vomiting.
39	Do.	Do.	Do.	1	1	1	2 "	1 ..	8th "	Convulsion.
TOTAL				29	10	39				

21. The absolute quiescence of the disease in 1882 corroborates the remarks made by me at pages 94, 95 and 96 of my Report on the History of Cholera in India, from 1862 to 1881, prepared for the Special Committee in Cholera in regard to the periodical abatement and prevalence of the disease in every triennial period. The following extracts from that report are reproduced here:—

“The records of cholera mortality in the several Provinces show that the disease has its regular seasons of activity and of quiescence in alternation, not only in every year, but also in every cycle of years. This cycle is, as the records concurrently and consecutively show, one of three years, both for the several Provinces taken separately, and for all India taken as a whole; whilst in many instances this cyclic recurrence of cholera activity is observed to hold good for separate areas in the several Provinces also. In the annual alternations of rise and fall in cholera prevalence, it is observed, as a regularly-recurring phenomenon of the disease, that the periods of the vernal and autumnal equinoxes are the seasons of its absolute inactivity or minimum degrees of prevalence, even in the course of an epidemic; and that the months intervening between these and the northern, or summer, and the southern, or winter, solstices, respectively, are the seasons of its habitual activity or maximum degree of intensity, whether in ordinary course or in the course of an epidemic career. In this regularity of sequence considerable variation is observable according to the geographical positions and physical conditions of the regions or localities habitually affected by the disease, and most especially according to the climatic phenomena of their normal seasons. Nevertheless, the regularity is real and fixed both for the endemic (or tropical) and for the epidemic (or extra tropical) areas of cholera prevalence. The difference amounts only to one of proportion, according, primarily, to the severity or mildness of the epidemic season, and according, secondarily, as the regions or localities affected are, by the conditions of soil, climate, and health-circumstances of the people, favourable or unfavourable to the development of the activity of cholera.

That is to say, whatever be the conditions of the regions or localities affected by cholera in respect to the points mentioned, the disease never, as a rule, breaks out in them in epidemic prevalence except in its proper natural season for such activity, and then always as a part of a great generally diffused manifestation of the activity of the disease over a region or province subject to the prevailing climatic influences of the season. But it occasionally occurs that, under circumstances which favour its continuance, an epidemic prevalence of cholera, which has commenced in its normal course and proper season for such activity, may be, and not unfrequently is, prolonged into the succeeding season, which, under the ordinary circumstances, or normal conditions, is that of its natural quiescence, or of its usually minimum prevalence. Still, even in such instances of unduly prolonged prevalence, the tendency of the disease is very markedly towards abatement or complete subsidence, before the arrival in due course of the next season for its normal manifestation of activity. And then, if the conditions continue favourable to the epidemic prevalence of the disease, cholera again breaks out with revived force, and continues to prevail with greater or less severity until the approach of the next season for its natural abatement or normal quiescence; when it again markedly declines in activity, or, in the event of the cessation of the collateral circumstances favourable to its continued prevalence, ceases its activity altogether. The collateral circumstances which experience has proved to be favourable to the continued prevalence of a naturally developed seasonal epidemic of cholera are—

- (a).—Certain conditions of climate or weather, characterized in the main by an abnormal excess of atmospheric humidity and temperature, coupled with some ill-understood, but nevertheless very plainly perceived, changes in the electric condition of the air and the amount of its present ozone.
- (b).—Certain conditions of the soil favouring sudden and unduly active evaporation of moisture from its surface—as in normally water-logged or submerged areas when the excess of water is drained away and the soil begins to dry; and as in normally arid areas when rainfall moistens the parched surface; and as, in both cases, when seasons of unusual drought are followed by copious rain-fall, or are attended by periods of humidity of the atmosphere without rain-fall.
- (c).—Certain conditions of the life-circumstances of the people, characterized mainly by an abnormal reduction of the general health standard produced by either defect in food supply, or by unusual exposure to fatigues, privations and vicissitudes of weather—as in the case of troops in the field, or masses of the population on pilgrimage—which by accident may happen to be coincident with the normal seasonal activity of the disease, or which may be prolonged into the succeeding season of its normal abatement or quiescence.

It is the concurrent existence of these contingent or collateral circumstances, claimed to be favourable to the extraordinary development of a naturally prevalent cholera, which has from time to time, in widely distant parts of India, prolonged, intensified, and very largely extended, the violence and diffusion of the normal seasonal manifestations of the disease—manifestations, which otherwise, we are justified, from the normal deportment of cholera, in concluding would not have exceeded the bounds of the ordinary seasonal prevalence. Further, as these contingent or collateral circumstances are found—a fact which is abundantly illustrated in the records of the preceding pages—to influence

the seasonal regularity of cholera in the course of its yearly manifestations of alternating activity and quiescence, so are they found also to influence and control the phenomena of the cyclical prevalence of the disease; although not to the extent of destroying or completely obliterating that cyclical periodicity.

The statistics which have been produced in the preceding pages from the recorded deportment of cholera in the several Provinces of India during the series of twenty years ending 1881, show very clearly that the disease is governed in its manifestations of activity by a law which runs for three years in the several Provinces, as well as in the distinct areas of the several Provinces affected by cholera. The series of twenty years dealt with in this inquiry, as is shown by the statistics (despite their imperfections and incompleteness for several years of the series, so far as relates to the general civil populations), comprises six complete successive triennial cycles, and, commencing with the terminal year of a seventh, concludes with the initial year of an eighth. These triennial cycles are shown by the statistical returns to be natural periods,—successively following one upon the other, of cholera activity, abatement, and subsidence in more or less regularly recurring orderly sequence; but with very varying degrees of intensity not only in the different cycles, but in their component years as well. Of the precise conditions producing these varying degrees of intensity of prevalence of cholera, the statistics available do not afford sufficient data for the expression of any definite explanation, beyond the general statement that the severer epidemic outbreaks of cholera which have been recorded as occurring from time to time in different parts of the Indian continent, appear to have taken place during seasons of drought and famine, and to have been more or less seriously aggravated during the first falls of the long-withheld rain; whilst, as the rainfall increased, and both soil and air became supersaturated with moisture, the activity of the disease has always markedly abated, but sunk into subsidence with varying degrees of rapidity. A striking feature in the seasonal prevalence of the disease in some Provinces is the regularity of its summer and winter accessions of activity, and occasionally the prolonged continuance of these seasonal periods of activity with increasing intensity during great epidemics which are concurrent with drought and famine. The subject is one requiring careful inquiry and further elucidation by study of the statistics produced in these pages.

* * * * *

The records, however, so far as they go, show that cholera in India is a disease which, in point of prevalence, is very intimately related to, and dependent upon, the climatic and seasonal influences of the country, both as a whole and as made up of constituent parts.

And, further, that the effects of these climatic and seasonal influences, as manifested by the prevalence and fatality of the disease, are in a very remarkable manner modified and controlled by conditions of locality affecting the soil, the weather, and the life-circumstances of the people.

The records show very clearly that cholera in India has a three-year cycle in which it successively bursts out into activity, then abates, and finally subsides into quiescence. This successive course in the cyclical prevalence of the disease is clearly shown not only in the mortality returns for each of the Provinces, but usually in those also relating to their constituent districts. In some contiguous Provinces, this cycle of three years covers identical years common to the Provinces or regions of country so situated. In other Provinces or regions of country more widely separated by geographical position, though not always by character of physical condition, this triennial cycle does not cover the identical years common to the other regions or Provinces, but it includes one or more of their cycle years. The variation, however, is no greater than might be expected as the consequence of difference in geographical position, or latitude, which in India has a great deal to do with the seasonal manifestations of cholera activity, and, as a matter of fact, does not materially affect the general results derived from the tabulation of the cholera statistics of India treated as a whole.

These statistics, whether taken for the Provinces separately, or for the whole of India collectively show the same general results, namely, a remarkable uniformity in the triennial cyclical periodicity of cholera prevalence. The first of the three-year period is that of epidemic cholera prevalence in greater or less severity. The second year is that of abating prevalence. And the third is that of minimum prevalence or of absolute abeyance. And this, with few exceptions, which are intelligibly accounted for by the nature of the concurrent contingent circumstances—mostly of an accidental kind—is the general and established rule for the prevalence of cholera in India, as determined by the statistics available.

Such, briefly, are the general results presented by the statistics of cholera in India, both for the annual and for the triennial periods of its manifestations of activity; and this for the provincial areas separately or for their combination as a whole representative of India as a single and integral quantity. Descending to details and taking separate localities or areas in the several Provinces, we find a very striking uniformity in the results of the recorded statistics, varied only by such anomalies and irregularities as to time and severity as are easily to be understood in consideration of latitude, geographical position, season, life-conditions, and other strictly local accessories affecting the soil, the air, and the public health.

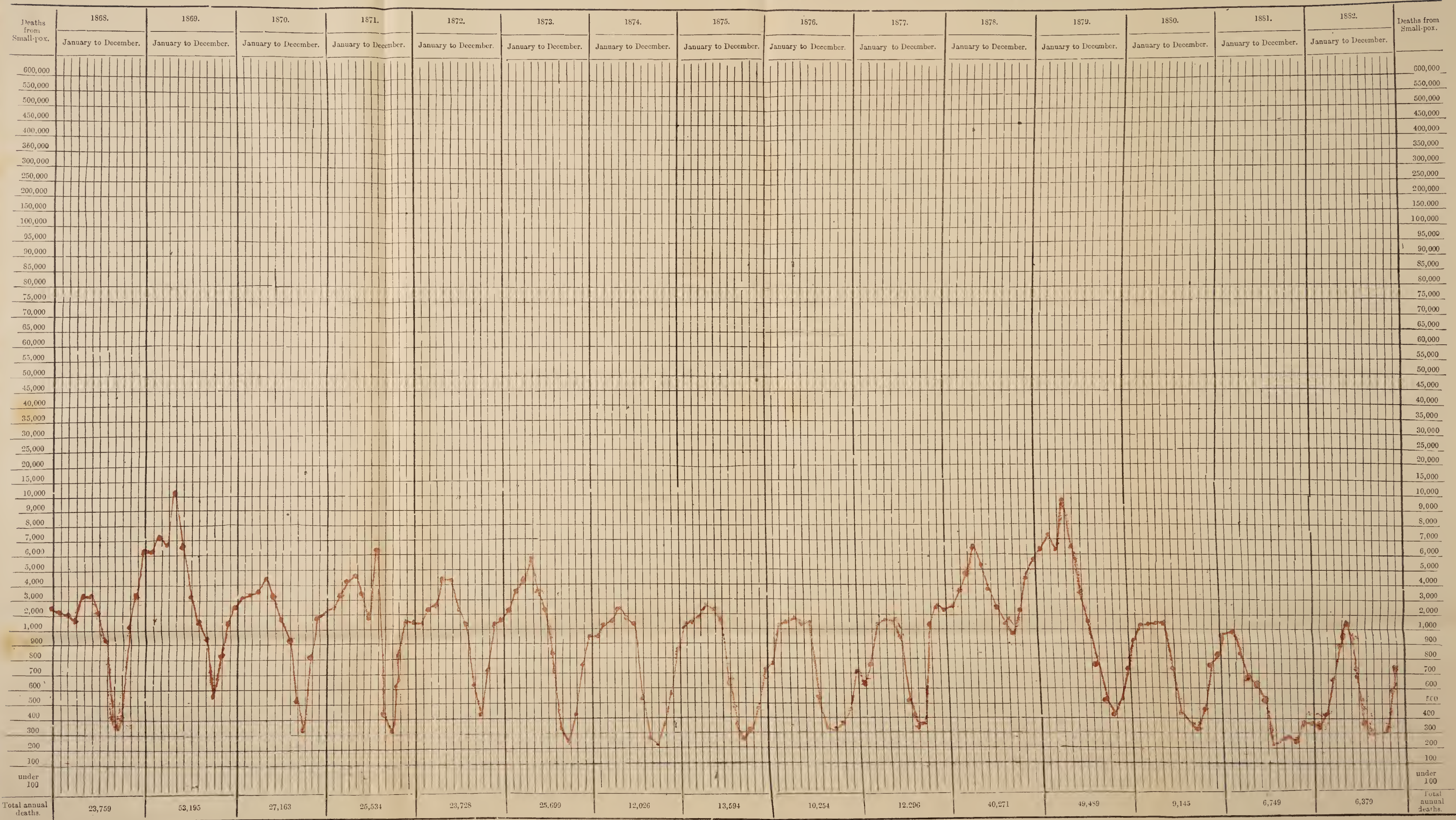
That is to say, in local manifestations of cholera, as part of a generally diffused provincial prevalence of the disease, we find nothing more than was to be expected from the known peculiarities in the deportment of the malady—such as its recognized partiality for particular spots or places, its sudden outburst into activity and equally sudden subsidence into quiescence, and, as is not unfrequently

observed to be the case, its tenacity upon a particular community. These local manifestations of cholera activity are not always simultaneous in their occurrence within the defined areas of districts or tracts of country affected by the disease; nor are the local outbreaks generally distributed over the area of the affected districts. On the contrary, a considerable diversity is observable in these respects. Nevertheless, they are always, as a general rule, confined within the periods of the normal seasonal prevalence of the disease, and although they may, and sometimes do, by their incidence in point of time, somewhat mar the regularity of the course of the seasonal prevalence of cholera in such limited areas, they do not materially affect the general results as regards the regularity of the seasonal prevalence of the disease for the larger area, region, or Province of which such affected districts form a component part."

Cholera map and chart.

22. The prescribed cholera map and statement are attached to this report, as also chart showing the rise and fall of the disease from 1868 to 1882.

CHART SHOWING DEATHS FROM SMALL-POX BY MONTHS IN THE PUNJAB PROVINCE, DURING THE YEARS 1868 TO 1882.



B. SMALL-POX.

23. The deaths from Small-pox numbered 6,379 or at the rate of 1·35 per 1,000 living. This is the lowest rate on record since 1868. The seasonal prevalence of the disease was as follows,—January 358, February 334, March 408, April 682, May 895, June 1,104, July 744, August 368, September 286, October 165, November 307, December 728; and the largest number of deaths occurred in the following districts,—Umballa 1,248, Lahore 629, Gurgaon 612, Karnál 643, Rohtak 434, Pesháwar 674, or nearly two-thirds of the total mortality of the entire Province. There can be no doubt that the cause of the high rate from small-pox in these districts is due to neglect of vaccination. In the Districts of Jhang, Muzaffargarh, Kángra and Hazára there was almost an entire immunity from the disease, the deaths in them having ranged between only 4 and 7. The Vaccination Section attached to this report gives further particulars under this head.

C. FEVERS.

24. The deaths ascribed to this class of disease were 346,680, or at the rate of 18·40 per 1,000 of population. In the two preceding years the mortality was 327,727 and 355,279 respectively, or in the proportion of 18·74 and 20·32 deaths per 1,000 living, calculated on the population of 1868. The mean fever death-rate of the Punjab Province for the five previous years is 20·77, thus showing that nearly three-fourths of the entire mortality in each year is due to this class of disease.

25. The Statements and Charts appended to my previous reports are again given, viz., Charts A, B, C and D, and the tabular statement showing the aggregate rainfall and the fever mortality by quarters and the average annual rates of the principal articles of diet for each of the 32 districts of the Punjab, during the years 1877 to 1881 inclusive. The statistics of the year under review are now added to the above, and I may here observe that on examination they fully corroborate my remarks as recorded in the Sanitary Reports for the past five years under this Section, in regard to the origin, intensity and seasonal prevalence of this class of disease.

26. The number of deaths registered during 1882 in each month of the year in the Punjab Province is given in the margin. They show that as usual the disease broke out in September and caused 31,634 deaths, or nearly 10,000 in excess of the previous month. In October it rose to 42,299, and in November it attained its maximum of 51,289; in December it was 50,619, or a decrease of only 670 from that recorded in November. With the exception of January, in which the registered mortality was 27,661, that registered in the seven following months, viz., February to August, varied between only 18,000 and 22,000.

The peculiarity of the year under review has been the marked abnormality in the distribution of the rainfall, which in most of the Western districts has been in excess, and in the Eastern in defect of the average, except in the districts of Karnál and Gurdáspur, in which there is a slight excess over the average.

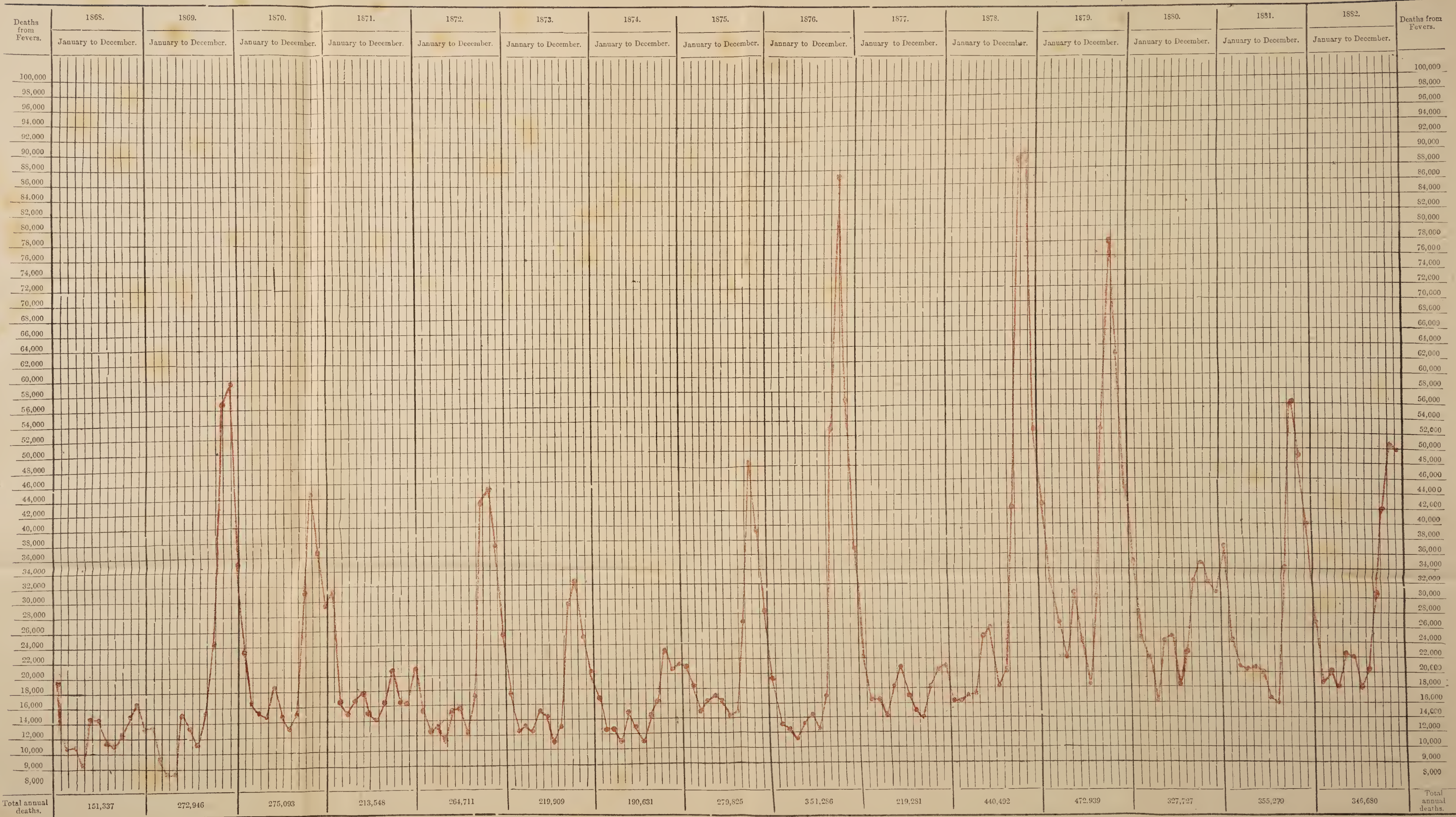
27. The districts which showed a high death-rate from this disease were Rawalpindi, Jhelum, Shahpur, Mooltan, Jhang, Muzaffargarh, Dera Ismail Khan, Dera Gházi Khan and Bannu, as will be seen from the following table, in which the death ratios for the two preceding years are also given for the sake of comparison :—

Fever death-rate from 1880 to 1882.

No.	DISTRICTS.	1880.	1881.	1882.
1	Delhi ...	25·58	25·84	19·06
2	Gurgaon ...	19·28	21·31	19·19
3	Karnál ...	27·85	24·06	19·95
4	Hissar ...	14·61	19·19	14·67
5	Rohtak ...	21·58	22·70	18·22
6	Sirsa ...	14·58	20·73	13·53
7	Umballa ...	21·87	24·55	18·40
8	Ludhiána ...	17·81	20·13	14·23
9	Simla ...	9·35	8·39	5·66
10	Jullundur ...	18·95	19·64	13·81
11	Hoshiárpur ...	19·29	20·15	15·84
12	Kángra ...	20·75	18·81	16·21
13	Amritsar ...	17·56	34·78	16·32
14	Gurdáspur ...	19·75	19·57	17·22
15	Siálkot ...	15·44	19·42	14·58
16	Lahore ...	20·09	27·15	18·87
17	Gujránwála ...	19·47	17·53	16·70
18	Ferozepore ...	15·40	21·01	13·72
19	Ráwalpindi ...	26·18	18·53	23·54
20	Jhelum ...	19·05	14·96	25·70
21	Gujrat ...	19·11	13·20	13·27
22	Shahpur ...	13·83	12·03	29·38
23	Mooltan ...	17·46	23·24	27·17
24	Jhang ...	10·31	10·91	21·55
25	Montgomery ...	13·52	19·67	15·49
26	Muzaffargarh ...	21·05	22·76	37·95
27	Dera Ismail Khan ...	16·39	13·98	25·22
28	Dera Gházi Khan ...	13·42	13·38	24·59
29	Bannu ...	16·56	14·42	19·86
30	Pesháwar ...	13·29	16·59	12·31
31	Hazára ...	14·05	15·81	18·75
32	Kohát ...	12·06	12·27	12·46
TOTAL ...		18·74	20·32	18·40

A.

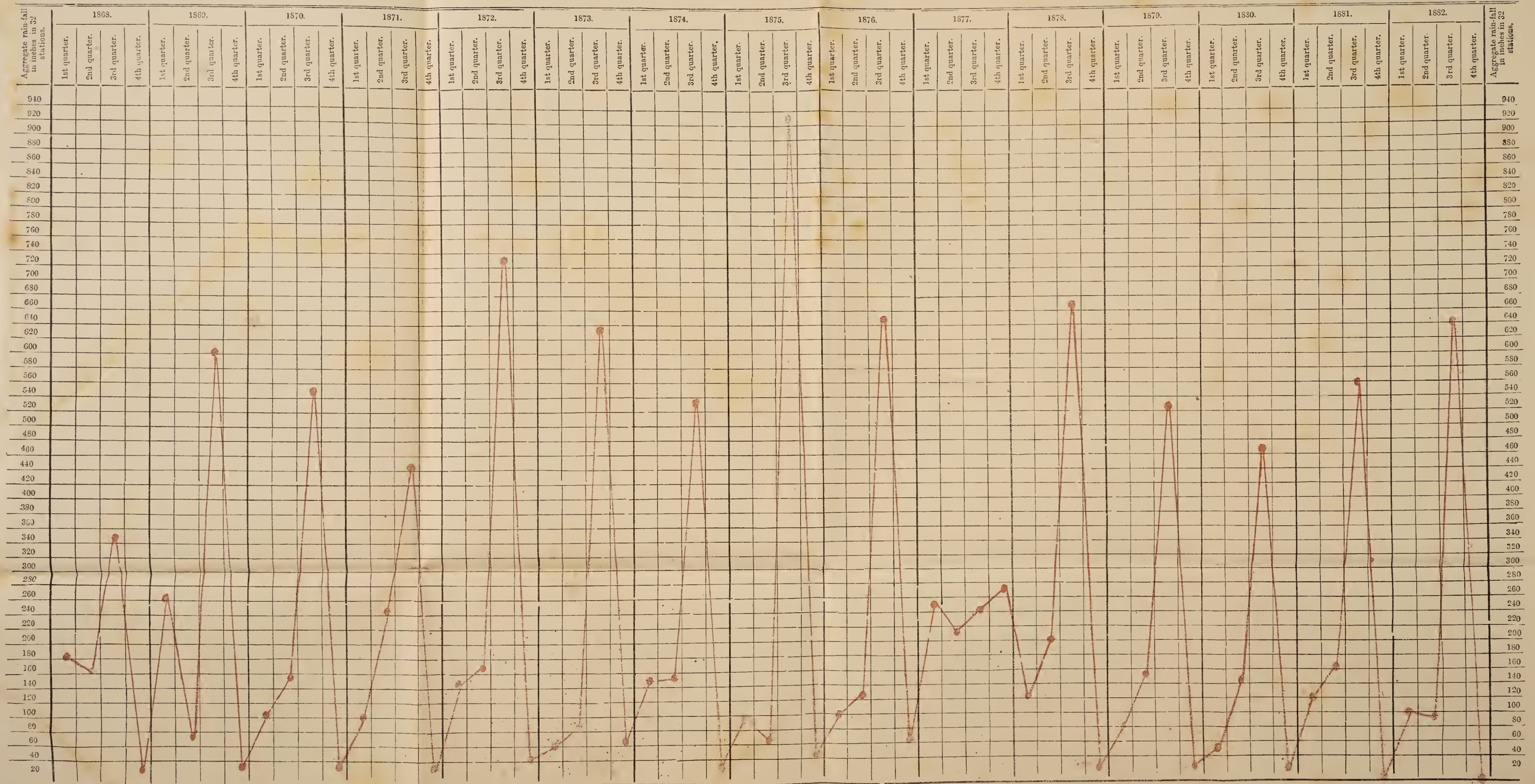
CHART SHOWING DEATHS FROM FEVERS BY MONTHS IN THE PUNJAB PROVINCE, DURING THE YEARS 1868 to 1882.

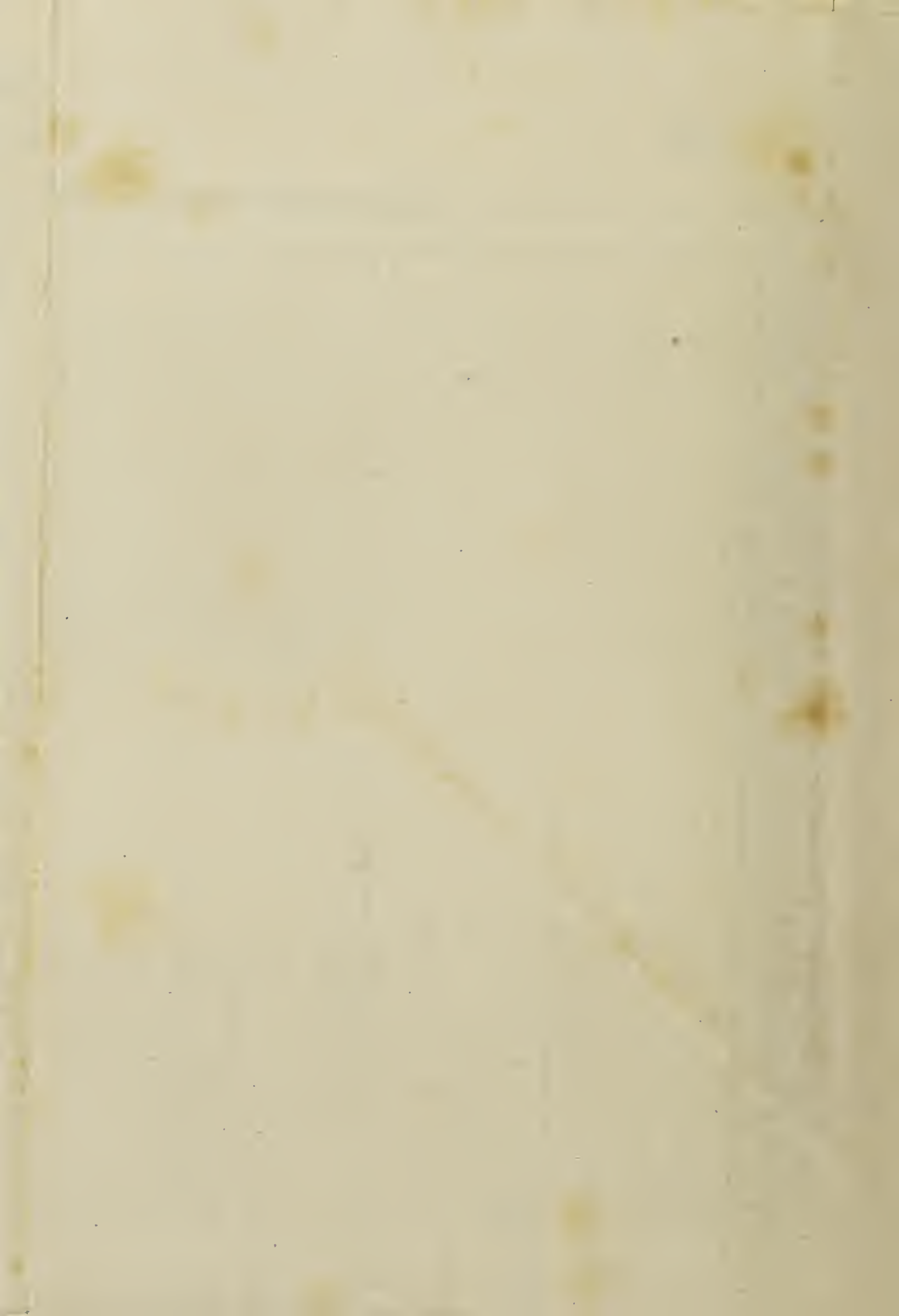




B.

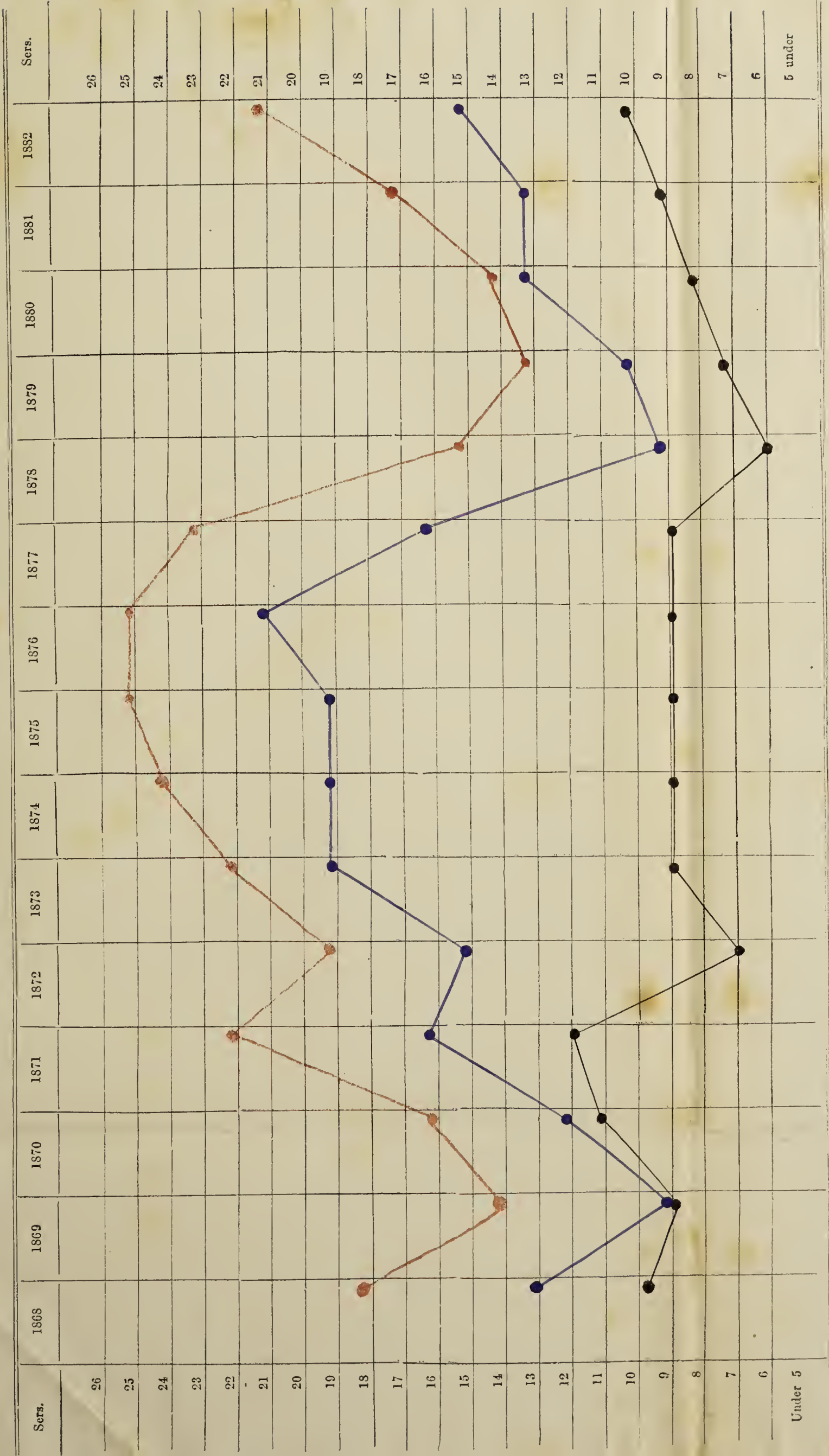
Chart showing the Distribution of Rain-fall in inches in the Punjab, by quarters, during the years 1868 to 1882 inclusive.





C.

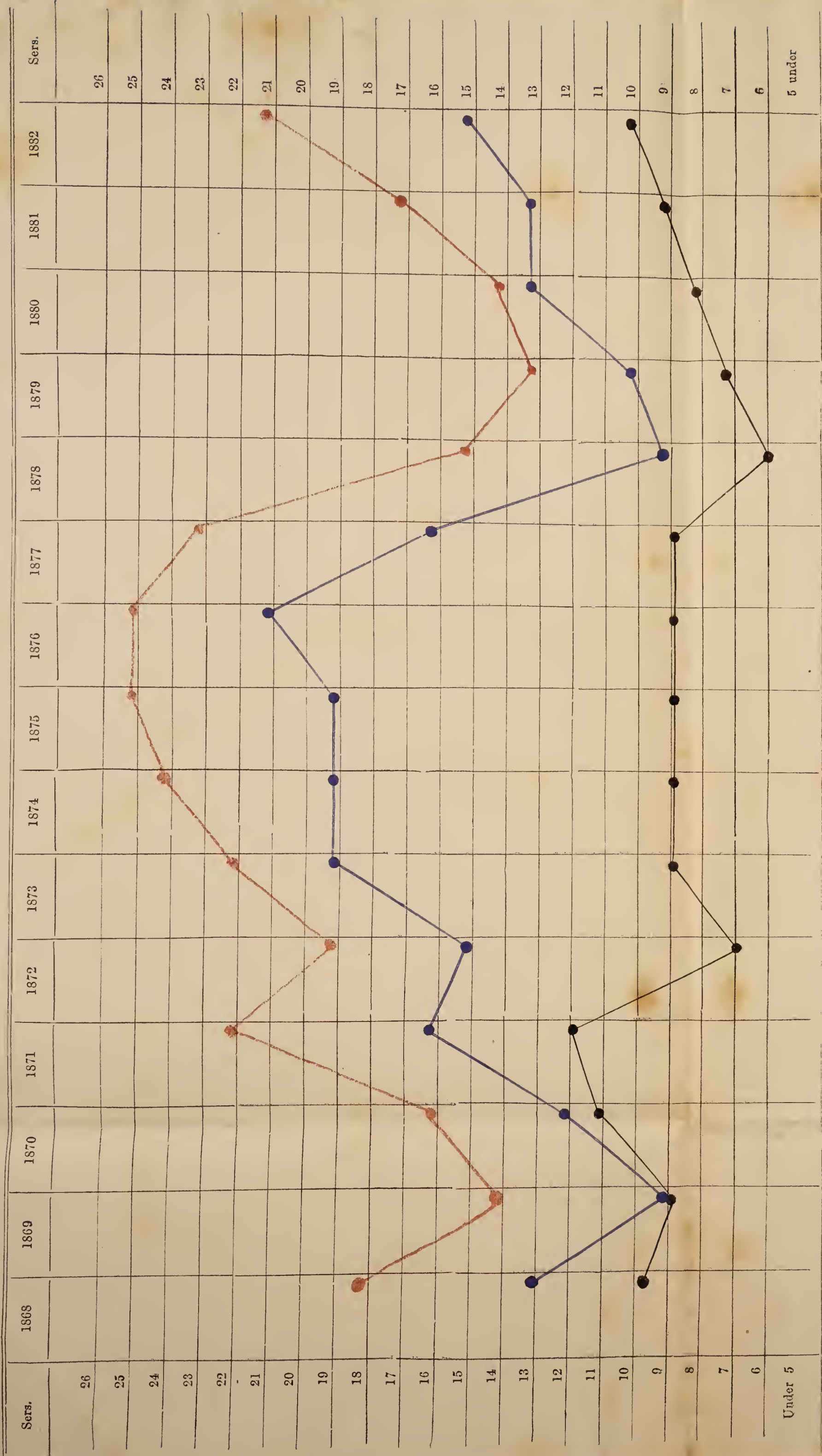
Chart showing the rise and fall in the price of principal food grains during the years 1868 to 1882 inclusive.



Wheat. ■ Pulses. ■ Rice. ■

C.

Chart showing the rise and fall in the price of principal food grains during the years 1868 to 1882 inclusive.



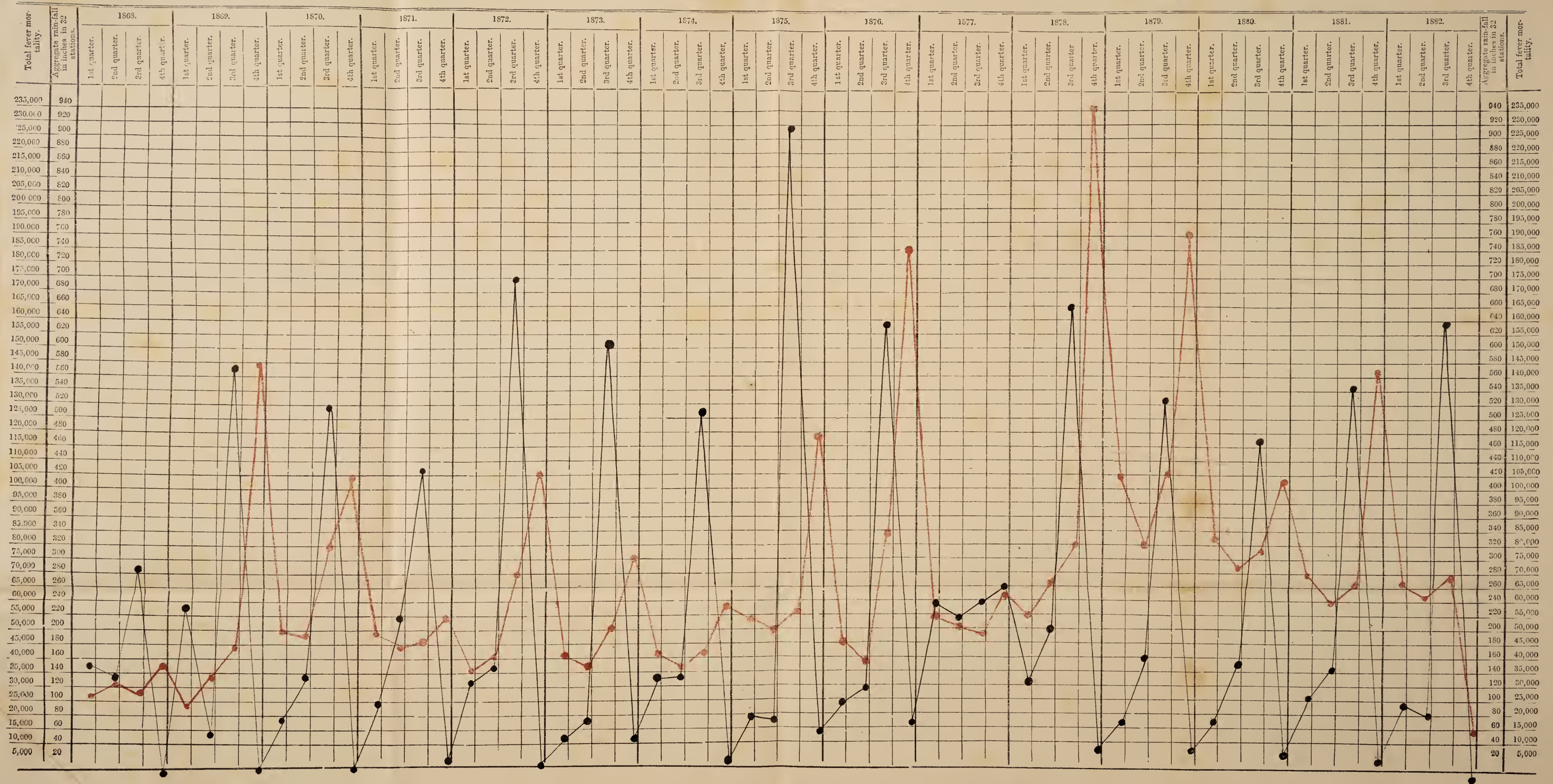
Wheat.

Pulses.

Rice.

D.

Chart showing the Distribution of Deaths from Fever and Aggregate Rain-fall in inches in the Punjab, by quarters, during the years 1868 to 1882 inclusive.



NOTE.—The black line wave denotes aggregate rain-fall.
The red ditto ditto the total fever mortality.

STATEMENT SHOWING THE AGGREGATE RAINFALL BY QUARTERS, PRICE CURRENT OF THE CHIEF ARTICLES OF FOOD BY YEARS, AND THE FEVER MORTALITY BY QUARTERS FOR EACH OF THE 32 DISTRICTS OF THE PUNJAB DURING THE YEARS 1877 TO 1882 INCLUSIVE.

[illegible]

Aggregate of Rainfall and total of Fever deaths registered in the Punjab, by months, for the years 1868 to 1882, inclusive.

MONTHS.	1869.		1870.		1871.		1872.		1873.		1874.		1875.		1876.		1877.		1878.		1879.		1880.		1881.		1882.			
	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.	Aggregate rain-fall.	Fever deaths.		
January ..	34.2	13,398	53.1	13,596	9.5	23,396	7.6	31,430	60.2	15,146	31.8	17,075	54.3	17,170	6.7	21,584	19.3	19,815	85.7	22,411	31.5	19,507	0.7	43,248	11.8	35,681	2.5	27,990	66.2	27,661
February ..	73.6	10,607	22.7	9,930	9.4	16,148	100.4	16,450	33.4	12,667	8.6	12,781	32.1	12,637	68.2	18,534	18.3	13,570	102.4	16,985	83.7	16,518	6.4	32,994	48.6	25,054	39.3	24,925	30.2	19,093
March ..	63.1	10,440	178.4	8,730	77.3	15,854	4.3	15,839	46.2	13,169	24.9	13,717	55.6	12,543	10.5	15,419	59.0	12,771	50.6	16,569	7.3	17,739	66.2	27,177	0.4	22,031	78.3	21,801	9.6	20,129
April ..	64.6	9,122	9.7	8,869	15.1	14,561	13.1	16,614	30.0	11,827	2.6	12,291	14.9	11,265	1.3	16,224	41.8	11,973	85.1	14,011	75.9	17,990	0.9	22,066	5.1	19,594	47.5	21,383	30.4	18,656
May ..	21.9	14,281	1.7	15,168	3.9	18,267	31.9	17,032	44.0	15,553	67.9	15,613	11.5	15,617	39.6	17,856	34.0	13,588	50.6	18,012	89.0	25,722	5.0	31,702	18.1	24,336	23.3	21,848	10.3	23,046
June ..	66.1	14,011	60.0	13,534	131.7	15,885	199.1	15,230	93.5	15,859	10.9	14,857	117.8	13,327	34.6	16,133	36.4	14,182	72.1	21,329	21.6	26,367	139.1	24,881	117.5	25,902	93.4	20,801	52.7	22,642
July ..	193.6	11,763	275.4	11,582	198.0	13,734	270.4	14,281	329.0	11,229	302.3	11,191	271.4	11,265	259.7	14,310	366.0	12,712	87.4	17,770	221.7	19,576	169.8	19,333	277.9	18,852	274.6	17,423	323.3	18,202
August ..	98.2	11,019	115.4	15,807	253.8	15,595	138.6	16,434	268.3	17,862	208.8	13,595	192.8	14,682	331.5	15,164	183.9	17,475	36.3	15,769	385.6	20,599	281.4	30,905	110.5	23,668	238.6	17,249	172.9	21,430
September..	24.6	12,169	207.8	24,010	80.2	31,307	42.9	20,858	117.4	43,836	103.5	29,951	86.6	16,379	333.1	27,595	80.1	53,465	105.4	14,938	45.9	42,943	58.9	53,592	71.0	32,501	40.7	34,396	149.9	31,634
October ..	2.3	15,035	20.6	56,623	9.0	44,221	0.5	19,166	4.9	45,019	20.5	32,292	0.2	23,274	24.3	48,698	47.9	87,062	43.1	18,623	8.6	89,687	0.8	78,173	0.1	35,762	5.4	56,868	0.4	42,299
November..	..	16,064	0.1	59,917	..	36,332	..	19,069	0.5	37,416	1.8	25,888	..	20,932	10.2	39,807	12.4	57,186	76.3	21,214	..	90,669	..	63,833	5.1	32,373	..	49,203	..	51,269
December ..	19.3	13,428	6.7	35,180	12.5	29,793	31.7	21,085	16.1	25,128	24.3	20,701	0.4	21,540	21.1	28,501	2.1	37,497	135.8	21,650	5.4	53,175	22.8	45,035	32.0	31,973	2.8	40,825	2.1	50,619
TOTAL ..	660.9	151,337	951.6	272,946	800.4	275,093	829.9	213,548	1,043.5	264,711	813.1	219,901	837.7	190,631	1,140.8	279,825	901.2	351,286	931.3	219,281	976.2	440,492	752.0	472,939	698.1	327,727	846.4	355,279	848.0	346,680

Average Annual price of principal Food grains.

	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
Wheat	...	18	14	16	22	20	24	25	25	23	15	13	14	17	21
Rice	...	10	9	11	12	7	9	9	9	9	6	7	8	9	10
Pulses	...	13	9	12	16	15	19	19	21	17	9	10	13	13	15

28. On the 3rd of November 1882, I reported to Government that there was a considerable rise in the fever mortality in the districts above mentioned, and suggested that enquiries should be made through the Commissioners of the Mooltan, Rawalpindi and Derajat Divisions as to the real causes which gave rise to this increased mortality, that the principal points requiring investigation were, whether there was any unusual distress caused by high prices of food grains amongst the population affected by the fever epidemic, and also whether there was any unusually heavy rainfall during the monsoons coincident with such distress in these districts. The replies to this enquiry from the several District Officers are as follow :—

Jhelum.—The Deputy Commissioner states that the high death-rate from fever arose solely on account of the exceedingly heavy rains and consequent floods from the river. The water came up round the city of Pind Dadan Khan, and entered the streets and lanes, in some places to the depth of over two feet. All the low ground from Jhelum along the river was swamped, and fever necessarily supervened. There is no distress whatever in the district. Prices are low, and the last two crops have been excellent.

Shahpur.—The fever in the Shahpur District is entirely of a malarious type. The Deputy Commissioner states that he has just returned from a tour in the direction of Miani, Bhera, Sahiwal, Giro, Khushab, and the alignment of the Jhelum river where fever is most, and does not find there is any want owing to high prices, but that the fever is entirely due to heavy and repeated floods caused by repeated freshes in the Jhelum river, which inundated this district, and when the water receded swamped all the low localities which surround most Indian villages and towns, leaving marshes and hollows full of green water. These floods have also brought the springs to a high level, and the sun still being warm in the day, the morning and evenings are cold. And these sudden changes, together with the air being charged with malaria, is, in his opinion, the chief cause of this serious outbreak of fever from which neither Europeans nor Natives have escaped.

Mooltan.—The Deputy Commissioner forwards a statement, which I give below, showing the comparative prices of the food-grains in September and October, during the last three years, and also a comparison of the rainfall up to October in each year; and from this it is seen that every kind of grain was much cheaper in September and October of 1882 than in the same months of 1880 and 1881. The harvests have been excellent. The rainfall in the first ten months of 1882 was much higher than in 1880 and 1881, and also higher than the average for a long series of years. After consulting the Civil Surgeon, the Deputy Commissioner is of opinion that the causes of the fever were purely climatic and probably arose from the heavy rainfall.

Comparative Statement of prices of food-grains for September and October of the past 3 years, and Rainfall up to 31st October 1882 and the average.

Names of food grains.		1880.				1881.				1882.				Names of Tahsils.	RAINFALL FOR 3 YEARS UP TO OCTOBER.			
		Septr.		Octr.		Septr.		Octr.		Septr.		Octr.			1880.	1881.	1882.	
		Srs.	Chs.	Srs.	Chs.	Srs.	Chs.	Srs.	Chs.	Srs.	Chs.	Srs.	Chs.		Inches.	Inches.	Inches.	
Wheat	...	12	...	12	...	14	...	14	4	17	4	17	4	Mooltan	...	3.9	2.5	7.9
Barley	...	18	...	16	8	20	...	21	...	29	...	28	...	Shujabad	...	1.6	1.6	5.0
Rice	...	8	...	8	...	9	...	8	...	10	...	10	...	Lodhrán	...	1.9	3.9	6.2
Bajra	...	16	...	15	...	14	...	19	...	24	...	26	...	Mailsi	...	4.6	7.9	6.2
Jowar	...	16	...	18	...	20	...	21	...	30	...	30	...	Serai Sidhu	...	0.7	3.2	9.9
Gram	...	16	...	15	8	17	...	19	...	23	8	24	...	Total	...	12.7	19.1	34.6
Average.															...	2.5	3.8	6.9

Muzaffargarh.—The Deputy Commissioner reports that in the months of August and September excessive rain fell in this district, causing the fields to be flooded. The people would not use the canal water in consequence, and the water ran to the lower end of the district and was banked up. The rivers burst over the country and the canals also flooded it. The malaria that arose caused an epidemic of fever which has only recently abated.

Jhang.—The Deputy Commissioner states that there has been no scarcity to account for the heavy mortality in this district. The causes of the mortality are two—(1) two of the highest floods remembered occurred on the Jhelum this year, and the Chenab also rose high late in the season; (2) the rains here were double the usual average.

Dera Ismail Khan.—The rainfall throughout the district was in July and August last quite abnormal, over 3 inches being twice recorded as falling within 24 hours on
 24th July 1882 *Inches.* 3·50 dates marginally noted. Both falls were general, but heaviest in the Trans-
 31st August 1882 ... 3·16 Indus. In addition to this, the July and August floods from the hills were greater in volume than known since 1874. The Indus too rose much higher than usual, and flooded and swamped lands which had been dry for years. The consequence of all this has been that, except throughout the sandy Thall Cis-Indus, fever has been general throughout the district, and in certain parts, *e. g.*, Dera Ismail Khan city and suburbs, the type of fever has, as the autumn has advanced, grown worse.

The type is distinctly low malarial fever, and so persistent that it sticks to persons for weeks and weeks after the first attack. The mortality amongst the old and weak and poor, and particularly amongst infants, is now, natives assure me, very great. Since 1878, when the Luni water was first fully introduced here, the Dera town has lost its reputation for healthiness. All food grains are cheap, hence high prices have nothing to do with the general prevalence of fever in certain parts. The natives, one and all, say, and probably with reason, that until we have a good fall of rain or a strong breeze blows fever and cognate diseases will not abate.

Dera Gházi Khan.—The cause assigned for the prevalence of fever in this district is the heavy rainfall in July and August.

Bannu.—The Assistant Surgeon of Bannu submits a short report of the fever prevailing in the Rural Circle of Dhák in this district, and states that, as far as his judgment goes, fever is intermittent, and is the result of heavy rains and good crops this year.

29. I would here state—and I have already dealt with the subject at some length in my previous reports,*—that the cause of sickness and death from these malarious fevers is to a great extent preventible by an efficient drainage of the soil, and by precautions in the matters of habitation, clothing, and food. In proportion as these matters are attended to and exposure to “chill” provided against, not only by the adoption of suitable sanitary measures for the welfare of the general community, but also by attention on the part of the individual to ordinary precautions of personal protection from exposure to this most common cause of sickness in such localities, namely, to “chill”—the result of exposure in an unprotected state (whether from unsuitable clothing, faulty housing, or deficient food) to the alternations of temperature and humidity in the course of night and day—so will the rates of sickness and death diminish.

30. In regard to the Jhang District, the following correspondence will show when the disease began to break out and what steps were taken to mitigate its ravages. On the 18th of September 1882, the Civil Surgeon, Assistant Surgeon Chetan Shah, Rai Bahadur, reported that “on account of heavy rains and more particularly on account of heavy floods, there is a great deal of malarious fevers especially in the villages on the banks of the Jhelum. I have visited some of these localities and made arrangements for distribution of Cinchona Febrifuge and other fever medicines. But I am afraid medicines distributed by the vaccinators, &c., cannot reach so many villages and villagers.” In the beginning of November 1882, I deputed Dr. Doyle, the Deputy Sanitary Commissioner, Western Circle, to Jhang, to investigate the matter. His report, dated 23rd December 1882 is herewith subjoined:

COPY of report on the prevalence of malarious fever in the Jhang District, by SURGEON B. DOYLE,
 Deputy Sanitary Commissioner, Western Circle, Punjab.

In compliance with your demi-official instructions, I have the honor to submit a report on the fever which has prevailed in the Jhang District this autumn. Owing to my having received from you, more recently, instructions to visit Faridkot, I was unable to see the whole of the fever-stricken district.

2. The villages along the river banks suffered from the fever, while the Bár and Thal country escaped.

3. My observations were mostly made in the Masan Thana. This lies between the Chenáb and the Jhelum, and it extends to their meeting.

4. The people attributed the fever to the floods, and in a lesser degree to the unusually heavy rainfall. The Jhelum floods were much greater than those of the Chenáb, the villages along the Jhelum suffered more from fever. I understand there were two main floods, but I could not fix precisely the dates. The first flood, however, came down, about the end of August, the second and greater flood late in September. Fever set in badly, when the first flood began to dry up. During the time, about 10 or 12 days, the ground remained covered by the water of the second flood, the fever abated somewhat. When the country began to dry up a second time, the fever again set in worse than ever. The lower part of the Thana, where the rivers converge to their meeting was flooded, the upper portion to a great extent remained dry. The villages, however, suffered in all cases from fever even where the flood did not reach to within two or three miles of a village. Villages within the flood suffered most severely.

* See Sanitary Reports for 1877, 1878, 1879, and 1880, Section C.—Fever.

In the Kalar and Gujar Khan Thanas of the Rawalpindi District, fever became very common throughout the villages, about the end of October, where up to this time, there had been comparatively little fever for the time of year. These Thanas were not flooded by rivers, but a heavy downpour about the middle of September closed an unusually wet rainy season. The prevalence of fever, therefore, followed the last of the rains in five or six weeks.

In the Jhang District the fever followed immediately the drying up of the floods.

5. The fever appears to have been altogether malarious, chiefly quotidian, in some cases tertian or quartan. Many cases, fatal within a few days, were probably remittent or continuous; I did not see the fever, however, until it had begun to decline.

I tried to find evidence of contagious fever, more particularly of common typhus, and of spirillum fever as described by Dr. Carter at Bombay.

One lambardar volunteered the opinion that some people who had come from the Jhelum District brought the fever with them into his village.

The flood reached to within about two miles of this village, and the village was close to the Jhang, Shahpur road. The fever, however, broke out almost simultaneously over a large tract of country, and the severity of the outbreak was directly proportional to the floods, communication between villages on different banks of the rivers was difficult at this time and many of the fever-stricken villages were probably not visited by strangers during this period. On the other hand, I was told that several people crossed over to Jhang and Maghiána to get away from the flooded or fever-stricken country, and there is no evidence that these people brought contagion with them.

Many people whom I saw with intermittent fever told me they got their first attack of fever this autumn at the time of the general outbreak. The fever was of the same character all through, though it gradually became less severe. In many cases it broke out again and again, after intervals altogether irregular. The lambardar to whom I have referred was the only person whom I heard attribute the fever to contagion. The predominance of quotidian fever contrasts with what I saw last year in Karnál in those villages situated along the Western Jumna Canal, where quartan was more usually complained of. It is possible that in Karnál cases of quotidian fever which is generally less persistent, may not have been brought to notice. The villagers of the Masan Thana seemed to agree in thinking quartan fever more difficult to get rid of, and I believe that if it had been prevalent they would have told me. I cannot say whether in the case of overwetness of the soil from irrigation, the type is apt to differ from that caused by occasional floods. The water in the wells in Masan Thana in the latter half of November was about six or eight feet from the surface. As the surface throughout part of the district is uneven the depth varied greatly. As the villages are frequently built on rising ground, the wells are in consequence deeper. The soil is mostly a mixture of sand and clay, the proportion of sand is greater towards the Chenab. The annexed table shows the registered mortality from "fever" and "other causes," in 53 villages of the Masan Thana for August, September, October, and 25 days of November 1882.

Table showing registered mortality from Fever and other causes in 53 villages of the Masan Thana, Jhang District, for August, September, October and 25 days of November 1882.

MONTH.	1 month & under.	1 year & under.	2 to 5 years.	6 to 20 years.	21 to 49 years.	50 years & over.	Total.	Male.	Female.	Hindus.	Muham- madans.
<i>August.</i>											
Fever	9	23	6	2	4	3	38	19	19	6	32
Other causes	10	14	4	0	6	3	27	16	11	5	22
Total	19	37	10	2	10	6	65	35	30	11	54
<i>September.</i>											
Fever	13	67	27	9	2	16	121	54	67	31	90
Other causes	18	21	10	2	2	8	43	18	25	8	35
Total	31	88	37	11	4	24	164	72	92	39	125
<i>October.</i>											
Fever	19	88	43	14	17	40	202	105	97	37	165
Other causes	14	17	9	3	5	9	43	20	23	12	31
Total	33	105	52	17	22	49	245	125	120	49	196
<i>November.</i>											
Fever	2	46	16	9	7	27	105	47	58	16	89
Other causes	13	22	0	3	5	8	38	20	18	8	30
Total	15	68	16	12	12	35	143	67	76	24	119
Fever	43	224	92	34	30	86	466	225	241	90	376
Other causes	55	74	23	8	18	23	151	74	77	33	118
Total four months	98	298	115	42	48	114	617	299	318	123	494
Per cent. of total mortality	15.88	48.30	18.64	6.80	7.78	18.48	100.00	48.46	51.54	19.94	80.06

In many cases more than one village was included in a single pair of birth and death registers, on this account there are only 30 separate registers, for these 53 villages. Registration was difficult, as the Chaukidar and Thana officials suffered from the fever. I could not find out the population of these villages, but many of them are small. Amongst the "other causes" are included all cases in which the name of the disease was not entered, or could not be read, no doubt many cases of fever are included. 617 deaths from all causes, have been registered. 48 per cent. were under one year and 67 per cent. were under 50 years or over. Only 15 per cent. of the total deaths, therefore, occurred amongst those aged between five or 50 years (both inclusive). There is no evidence as to whether children were more prone to get the fever or whether it attacked them more severely than it did adults. In many villages, every one, I believe, young and old, got fever, and the greater mortality amongst the children may have been due solely to their feebler vitality. Frequently the whole household was prostrated at once: the children then fared worst of all. Though food was cheap throughout the district, many people suffered from want of food, in cases where there was no one to cook it or to attend on the sick. A Zaildar who was at Amritsar last year during the bad fever told me that the circumstances were much alike. I was told that many children whose mothers were ill were born before full term. In the village registers 22 children are returned as born dead. Some children are registered as having had fever on the day of birth, others on the 2nd, or 3rd day, &c. I had no opportunity of making clinical observations concerning this point or of determining whether newly born children showed other signs of malaria, such as enlarged spleen. The annexed table shows the average duration in days of fatal cases; cases lasting one month and over have been excluded. Many children who died shortly after birth, and in whose case no disease was made out, have been shown amongst other causes. Table showing the average duration in days of fatal cases registered as Fever. The "other causes" includes all other deaths, whether the disease has been entered or not. In the case of many children who died soon after birth no diagnosis was made, frequently such entries as "the child did not drink milk," "died from the will of God," &c., occur. Such cases reduced the average number of days from other causes. There was usually some entry made in the column for disease, which shows care in writing up the register.

Cases of one month and over, duration is not included.

MONTH.	AVERAGE DURATION IN DAYS.	
	Fever.	Other causes.
August	7½	5½
September	7 (7·1)	5
October	10	7½
November	9½	4½ (4·6)

"Other causes" include 6 cases of Sarsam. Under fever is included one case of "Fever and Sarsam." The six cases may have been instances of fever delirium, their duration was 8, 2, 5, 2, 7 and 4 days. In four cases diarrhœa only, in 6 fever and diarrhœa, and in 2 belly ache is given as the cause of death.

6. The fever at the time of my visit was in some cases attended with vomiting and purging; this however usually ceased when the fever went off; the vomiting was of a "bilious" character. Diarrhœa and Dysentery were not prevalent in the villages I saw, and as noted above but few deaths were registered as bowel-complaints. Assistant Surgeon Chetan Shah, Civil Surgeon, let me have some febrifuge pills, &c., and also some remedies for dysentery and diarrhœa. I found, however, that, while great numbers sought for the fever pills, so that I could not supply their wants fully, comparatively few complained of diarrhœa. Before visiting the villages, however, I had heard that dysentery, or diarrhœa, was very prevalent.

In those persons, who continued to get fever up to the time of my visit, the preliminary cold stage was usually well marked. During the hot stage burning of the chest was especially complained of. In some cases the fever went off, without sweating, chest complications were not common at the time.

The people's habits as to clothing, &c., seemed to differ in no way from what obtains throughout most of the Punjab. I was told that some slept indoors during the early autumn, and some outside. I could not see that the fever marked out any one class, in a notable manner.

7. Febrifuge pills were served out to some villages. They were also given to Hakims, who practised in these villages; the Hakims used them. I was told at Masan, that a Hakim, who was well thought of, came to the village with medicines.

Treatment.

As he found, however, more patients than he could treat, he left in a couple of days ; he afterwards got fever. The pills were called quinine pills, but there was no wish, I believe, to deceive the people in the matter, and the villagers generally knew that the pills were not made of real quinine. The pills in some cases did good for the time and they seldom caused vomiting, except in children, when the pill had to be broken up. *Sharbats* as usual, were popular, and no doubt very useful, from soothing the patient. I could find no evidence that any of the *sharbats* used, warded off fresh attacks. The belief in quinine is universal. Those who can afford it, however, seldom buy it. The general treatment was of course of the most desultory descriptions, and many villages got no medicine. The whole of the villages could be treated only by making special arrangements and by spending a great deal of money.

8. The villagers at the time of my visit were almost all weak, and anæmic, and with spleens enlarged. The children were in a specially wretched state, and many of them probably will die from want of clothing, &c., during the winter. In addition to suffering temporarily from want of food, as before noted, the people have suffered less from failure of crops at the time of the flood, and also from having to support a number of men, unable from sickness to do a full day's work. I was shown in different villages, patches of wheat land, which were only partially sown for want of labour. I do not know whether the full crop will be sown afterwards. I believe, however, the people are not well off, and this of course will increase the mortality and keep the survivors weak.

31. In the beginning of December I myself proceeded to Jhang under the orders of the Punjab Sanitary Commissioner's report Government, and my letter to Deputy Commissioner, Jhang, and report of the outbreak. to Secretary to Government, Punjab, are herewith appended.

COPY of a letter No. 2720, dated Jhang, 15th December 1882, from Sanitary Commissioner, Punjab, to Deputy Commissioner, Jhang.

Under the orders of the Local Government, I have personally investigated into the causes of the recent excessive sickness and mortality in the Jhang District, and have the honor now to state for your information and guidance, the results of my inquiries and the necessary action which I consider to be expedient in order to mitigate the existing sickness and to lessen the mortality which may be otherwise expected to occur during the ensuing months of cold weather.

2. Yesterday I returned to this station from a tour to Kot Isa Shah, along the east bank of the Jhelum and back again along the opposite bank of that river; the tract included in this area being the portion of this district which has suffered most severely during the recent epidemic of malarious fevers. Everywhere in the area traversed I found the existing causes of the prevailing sickness to be in a change of the climate, produced by inundations and water-logging of the soil in the river valley, rendering the air of the country unusually damp and subject to chills with the alternation of night and day temperature; whilst the predisposing causes were due to defects in the sanitary surrounding of the people and to unfavourable conditions in the material prosperity of the labouring classes, mainly in respect to their being altogether insufficiently clad, and in respect to their poverty rendering them incapable of improving this unfavourable condition without aid of a charitable kind.

3. With reference to the sanitary defects alluded to above, there are some of great importance which are capable of immediate remedy, and these I beg now to point out for your information, with the means for their remedy. Without exception, I found all the villages visited in my tour in a very filthy and neglected state of conservancy. The system of village conservancy which was sanctioned by Government four years ago, and which has been adopted with marked advantage in many places, might well be introduced in this district. Its main feature consists in the establishment of manure stores or "khat godowns" on the outskirts of each village for the reception and storage of the village sweepings and filth of every description. These stores should be in number equal to the village wards and should be under the supervision of the lambardars of their respective wards; they should be formed at suitable sites, at least 100 yards from the village walls, by enclosing a space of 12 or 14 paces square within a low mud wall 3 feet high; the manure thus collected to be divided under the superintendence of the lambardar among the contributing houses when required for field use, which will be twice in the year as a rule. By the establishment of these simple and inexpensive receptacles of the village filth and refuse matters, the streets and courts will be freed of the abominations which now encumber the surface at every step, and the air of the place be purified of the filth, dust, and foul odours which now pervade it in the area inside and outside the village. I would draw your special attention to the importance of this simple means of efficient village conservancy. Its neglect in the case of the recent sickness has tended powerfully to aggravate the evils of the natural floodings and waterlogging of the soil from the river Jhelum, by filling the air with various exhalations from the decomposing filth scattered broadcast in and around the villages.

4. With respect to the other predisposing cause of sickness during the recent epidemic of malarious fevers to which I have alluded, namely, the altogether underclad condition of the people generally and the labouring classes more especially, I am fully aware of the difficulty of remedying this unfavourable condition, and yet it is the one remedy which in my opinion is needed to enable the poorer classes, and their children more especially, to battle for life against the effects of trying climatic influences. It is vain to seek to stem the current of sickness by medicine so long as the body afflicted

is continuously exposed to the very producing causes of that sickness. I found the labouring classes, and their children especially, everywhere in the tract traversed, miserably under-clad, and in fact altogether unprotected in anything like an adequate manner from the inclemency of the weather. Protection against cold, and chills and damp air in times of such sickness is a precaution of the first importance, and I would therefore most earnestly recommend that such aid as may be found available be extended to the poor in this district in order to enable them to clothe themselves more suitably to the requirements of the season and their climate. I would suggest the distribution of good blankets, either gratis or at a very cheap rate, among the poor cultivators and other village people, and the distribution of ready-made jackets of padded cotton for their children. I have been told that such jackets or *kurtas* can be made up of sizes according to age for from 4 annas for infants up to 1 rupee for children of 10 and 12 years of age. As the infant population is the most neglected in the matter of dress I would urge the importance of this means of protecting them during the ensuing cold months; the more so as the recent mortality has fallen with so marked severity upon this aged class of the community.

5. It appears to me that some aid might be derived by private subscriptions towards this object from the well-to-do among the people of the district, for the field of relief is large enough to tax the resources of the District Funds to their utmost extent. Besides these measures the people should be warned of the necessity of maintaining a warm and dry air in their dwellings by the use of fires in the inner rooms, especially in those where the ground floor is cold and damp.

*COPY of a report on the fever epidemic in the Jhang District, by Sanitary Commissioner, Punjab, to
address of Secretary to Government, Punjab, dated 15th December 1882.*

Referring to your No. 13 C, dated the 4th instant, with enclosures, I have the honor now to report, for the information of His Honor the Lieutenant-Governor, the results of my personal investigation into the causes of the unusual sickness and mortality in the Jhang District, during the past three or four months.

2. Leaving Lahore on the 7th instant, I arrived at Jhang on the following day, and having made arrangements to visit the area most severely affected by sickness, set out on the 10th for a tour in the district. The portion of the district in which the epidemic sickness of this year has fallen most severely is situated in the angle formed by the junction of the Jhelum river with the Chenab, extending from Jhang Maghiana to Kot Isa Shah, a distance of thirty miles, and it includes also the low land bordering on the opposite bank of the Jhelum river. In all this tract, the low lands bordering the actual river bed of the Jhelum and subject to inundation from it have suffered by far more severely than the higher lands lying further off from the river channel. I therefore directed my course through the principal villages along the river route to Kot Isa Shah and thence along the opposite bank of the Jhelum to Machiwal, whence I recrossed the river to Masan, and thence crossing the Chenab, returned to Jhang, where I arrived yesterday afternoon.

3. The most convenient way of describing the state of affairs observed will be to record briefly the results of each day's investigations.

4. On the 10th December I proceeded from Jhang to Chúnd and visited *en-route* the villages of Patwána, Kokára, Malláhan, and Hasan Khan, besides several hamlets and farmsteads scattered about between them. In none of the villages traversed in this day's route did I find much present sickness, but in all I received accounts of severe suffering from malarious fevers during the preceding three months. In the villages of Kokára and Malláhan Basti, on opposite banks of the Chenab river, a considerable portion of the inhabitants presented a sickly look from more or less pronounced anæmia and affection of the spleen; but the great majority of the population seen in all the tract traversed this day appeared to be in a generally healthy condition, and were everywhere occupied in the pursuit of their usual daily avocations.

5. On the 11th I proceeded from Chúnd to Bhamb and, visiting several hamlets and farmsteads on the way, inspected the villages of Alipur, Kutab Kalán, Kutab Khurd and Munda. In all this tract, also, sickness is now greatly abated; but almost everywhere the people showed more distinct signs of malarious cachexy than in the tract traversed in the preceding day's journey. Cases of anæmia and enlarged spleen, especially among children, were much more frequently observed; four cases of pleurisy and remittent fever were also seen, and I was informed that pleurisy (*zatuljanb*) had during the last few days been observed as a new feature in the prevailing sickness. At Bhamb Police Station I examined the Death Register of the circle. The Bhamb circle contains 115 villages, and the total number of deaths registered during the current year, up to date 11th December, was 2,318. In 1881 the total for the whole year was 1,030. The mortality among children and old people was very much greater than among adults at the intermediate periods of life, but I had not time to tabulate the figures on the spot.

6. On the 12th I proceeded from Bhamb to Kot Isa Shah, and besides others, visited *en-route* the principal villages of Kadirpur, Bashka, Chhatta, Sayadan and Kot Isa Shah itself. All these villages are situated on the low land in the river valley of the Jhelum, as distinct from the higher land further away towards the East, and their climate was observed to be perceptibly different from that of the villages

visited in the preceding day's journey. At about two miles from Bhamb, and half way to Kadirpur, I noticed a sensible change in the air, which now felt chill and damp, and this change was observed to obtain throughout the tract quite up to Kot Isa Shah, where indeed it was even more strongly marked, probably in consequence of the dense growth of trees around and about that village, coupled with the low level of its site and its proximity to the river bed. In all this tract, and in Kot Isa Shah and its vicinity most especially, the people generally presented a very sickly appearance; malarious anæmia was observed on almost every countenance, and enlarged spleen was found to be very common among the younger people. During the afternoon and evening I made two rounds of this village, and visited some 14 or 15 persons lying sick in their own houses, and besides felt the pulse and questioned some scores of the inhabitants, of all ages and both sexes, as I met them in the streets and bazars. The whole population appeared to be fever smitten. I found children in the lanes and courts, adults in their shops and about the bazar, women engaged in their household duties, and in fact almost everybody I met, all with more or less fever actually on them. They had become so accustomed to the daily recurrence of febrile attacks that they paid little attention to the ailment until finally it prevailed over their strength and prostrated them. In most the fever was simple ague of mild form and more frequently tertian than quotidian, but in a large number the fever assumed the form of influenza or "cold," with a catarrhal defluxion from the nose and eyes. I saw several such cases, and in others again I observed the presence of cough and pleuritic pains; but by far the most common form of fever was that of febrile malaise with more or less distinctly marked heat of body. From this form of malady almost the entire population was suffering. I saw very few who were completely free and in sound health. This mild form of fever did not prevent the sufferers from following their daily pursuits and occupations. I found a *bunnia* (he held out his hand to me as I passed along) serving his customers at the time he had high fever on him, and came upon several others, both men and women, moving about and working with fever actually on them. Of the sick I saw confined to their beds, none were in a very bad way, excepting two small children and one old man. I was shown also an aged woman who was apparently sinking fast, but I do not count her case among the others as she had long been bed-ridden with abdominal dropsy. Among these cases I noticed two with cough and pleuritic pains, and three or four others suffered from diarrhœa. Diarrhœa I was told, was much more prevalent a month or two ago than now, and it was then often accompanied with vomiting also. Many of those suffering from these symptoms died, but latterly vomiting is seldom noticed, and diarrhœa also is much less frequent, whilst coughs and pleurisy are becoming more common.

This village of Kot Isa Shah has suffered very severely from a variety of febrile maladies, all apparently of malarious origin. The people say that the excessive sickness commenced early in August, after the inundations of the preceding month had subsided. At first it was not of a fatal character, but in September it became so, and then vomiting and purging were common symptoms. Later again the fever appears to have changed from the intermittent to the remittent form, with diarrhœa still a prominent accompaniment. At present the intermittent is the most common type of fever, and the tertian form is said to prevail, whereas in the early part of the epidemic the quotidian form was the most common. During the last 10 days or fortnight, influenza and pulmonary affections have been noticed as occurring with increased frequency. The village of Kot Isa Shah contains 862 houses and a population of 2,864 (Census 1881), and the registered mortality during the current year is thus stated by quarters, namely:—

	<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
First quarter	9	15	24
Second "	13	9	22
Third "	25	26	51
Fourth (to 11th Decr.),	76	74	150
Total	123	124	247

At the time of my visit two or three deaths were occurring daily, but the people thought the violence of the epidemic was on the decline.

7. On the 13th I preceded from Kot Isa Shah to Machiwál on the opposite side of the Jhelum. After crossing the river my route lay along the belt of low land between the course of the stream and high bank of the desert tract to the Westward. The principal villages I visited in this tract are Mahri, Chanana, Shákar Kot, Sajan and Machiwál. All these, as well as the hamlets and farmsteads interspersed, had suffered severely during the preceding months, but were now more or less free from unusual sickness. The people, however, everywhere wore a sickly look, and the children particularly looked pale and unhealthy. In Marhi I saw five patients confined to their beds with fever, and in two of them pleurisy was present. In this village there was more sickness than in any of the others visited in this day's journey. The village lies at the foot and partly on the slope of the cliff or bank which demarcates the *thall*, or high desert tract, from the *kachi*, or low cultivated tract along the river's course, and is a good deal shut in by a dense growth of palm trees. Machiwál is also a good deal encumbered by close-growing trees, the palm and Indian fig being the most conspicuous.

8. On the 14th I proceeded from Machiwál across the Jhelum to Masan through the villages of Bunana, Saliáni, Telwara, and lesser hamlets. In all these the people wore an unhealthy look, and the children especially so, but I was assured that there was now no unusual sickness, though a month ago the whole circle of Masan was prostrated with fever. From Masan I returned to Jhang.

9. In the foregoing account I have made no allusion to the sanitary condition in which I found these villages, having reserved this subject for separate notice, in order to avoid constant repetitions; and the same remark also applies to the condition of the people in respect to their material prosperity. As regards the sanitary condition of the villages, I may say that, without exception, they were one and all in a very unsatisfactory state, and many of them absolutely in a filthy state, from sheer neglect, not only of a general system of conservancy, but even of ordinary domestic cleanliness. Litter, rubbish, ashes, cattle droppings and human ordure strewed the surface alike of lanes, courts, and village outskirts. In fact filth of sorts met the gaze in every direction, and in the dwellings of the poorer people was a very repulsive trait of their utter indifference to personal comfort and cleanliness. In these, both in their courts and in their interiors, the senses were offended at every step by unwholesome odours and filthy surroundings. The dwellings of the better classes were not so bad in their interiors, but in their courts and surroundings there was no great difference observable. An utter neglect of cleanliness reigned everywhere. In this respect the very unsatisfactory sanitary condition in which I found these villages is due entirely to the apathy and indifference of the people themselves. In another respect they are perhaps not so much to blame. I mean in respect to the sanitary aspects of the actual village sites. In all the low land tracts along either bank of the river the village sites are radically bad. The land here is not only excessively moist by percolation from the river, but it is subject to periodical inundations when the river is in flood. During the rainy season of this year, the local rainfall was unusually heavy in July, and added to this the river flood was much higher than usual, so that the periodical inundations were much more extensive and prolonged than had been experienced for many years, or, as is said, in the memory of the living.

To appreciate the evil consequences of such heavy rainfall and excessive inundation, it is necessary to bear in mind the physical peculiarities of the tract concerned in respect to its capabilities of affording a free natural outlet to the extraordinary accumulation of water upon its surface. The river Jhelum joins the stream of the Chenab at an angle which must necessarily impede the flow of the confluent current on the occasion of any sudden and excessive increase to the ordinary volume of its waters; and the consequence of such impediment would naturally be an undue accumulation of waters in the channel of the confluent stream with increased ground percolation on either side and inundations where the banks were low. During the rainy season of this year the streams of both the main river and its great confluent were inordinately swelled by heavy rainfall over the general area drained by these rivers and consequently the impediment to the onward flow of the Jhelum current was extraordinarily great and prolonged. The result was that the waters of the Jhelum were thrown back as it were upon themselves, and accumulated in undue quantity as far up the stream as Pind Dadan Khan, or even the town of Jhelum itself, and here and there breaking over the banks inundated more or less extensive areas of the adjacent lands, besides causing a greater or less degree of water-logging of the soil on either bank by ground percolation. In the Jhang District these results were most marked all along the banks of the Jhelum down to its junction with the Chenab, and the water-logging of the low-lands forming the actual valley of the Jhelum was so complete that, as I am informed, the wells in many places became brimful and in some places actually overflowed, whilst the soil was so charged with ground water that in some villages it was observed to well up into the holes formed by driving pegs for tethering cattle. This state of the soil lasted till the floods subsided, and then with the progressive subsidence of the river stream the ground water level also fell, but left a surface layer thoroughly saturated with moisture and exposed to excessively active evaporation under the action of the sun during August, September and October, after which month, with the declining force of the sun, the surface evaporation became less active.

This evaporation of moisture from the wetted soil materially altered the character of the climate rendering it unusually damp and subject to chills in the alternations of night and day temperature; whilst in and about the villages this unfavourable condition of the air was further added to by the unwholesome exhalations arising from the active decomposition of a variety and great abundance of filthy organic matters. These are the conditions of air and soil which have operated as the exciting causes of the severe epidemic sickness which has prevailed in the Jhang District since August last, and their operation and intensity have been greatly favoured by the predisposing causes connected with the life conditions of the population generally.

10. To understand the nature of these predisposing causes, it is necessary to be informed of the general state of material prosperity among the people and the habits of life obtaining among them. Without entering into minute details on these points, it will suffice for the purposes of this inquiry to state the broad fact that the mass of the village population are very poor and thriftless, and further that they are altogether inadequately protected by clothing and shelter from the effects upon the body of climatic changes such as those above indicated. Everywhere, in the tract visited, the mass of the people were much under-clad and the children habitually so to a dangerous degree. I could nowhere discover that any change in dress had been thought of even as a means of protection against the change which had occurred in the climate, nor had any measures been thought of to improve the warmth of the dwellings or to counteract the general damp and chill of the night air by means of fires. To this utter neglect of self-help is to be attributed the very high mortality among the children. They are all under-clad, ill-fed, and carelessly sheltered. In a large proportion of cases all this is the result of ignorance and indifference but in the great majority of cases, poverty and want of means is a very apparent cause. Under the existence of conditions such as these medicine is impotent as a remedy. The true remedy is abandonment of the affected tract, but as this is a measure beyond the reach of practice, the next alternative is the

adoption of means calculated to protect the body against the effects of climate. These means consist in the wearing of warm clothing, the use of fires in the houses, especially during the night, and the observance of cleanliness in and about the village sites. The majority of the population are, I believe, capable of providing these requisites for themselves, and to a considerable extent have already done so; but there is a great mass of the poor who are entirely helpless in this respect. They habitually live from hand to mouth, and are totally unable to better their wretched condition without extraneous aid. To these the most needed aid is that of warm clothing. The epidemic of malarious fevers is now steadily abating everywhere in this district, but it has left the population in a generally more or less impaired state of health, and as there are yet two or three months of trying cold weather to be faced, it is probable that other diseases, of the chest more particularly, may take the place of the recently prevalent malarious fevers, and prove equally fatal in their consequences. To give the poor a chance of weathering this cold season, I would recommend the distribution, either gratis or at a nominal price, of blankets and ready-made warm clothing for children.

11. To express the result of my personal investigation in a few words, I may say that the excessive sickness and mortality during the past four or five months in the Jhang District have been the results of exposure in an unprotected state of body to the vicissitudes of atmospheric temperature and moisture resulting from changes in the climatic conditions of the country produced by floods and water-logging of the soil, and that this unprotected state of the body is mainly due to insufficient clothing and inadequate warming of the dwellings. The obvious remedies therefore are adequate protection of the body by warm clothing and the thorough warming of the dwellings by the use of fires. Until these remedies are adopted, the mere administration of medicine will be in vain.

12. I beg to enclose for information copy of my letter to the Deputy Commissioner, Jhang, in connection with the present investigation.

D.—BOWEL COMPLAINTS.

32. The total deaths registered from Bowel Complaints during the year under review, were 15,960 against 17,281 in the previous year. Of the total of 15,960 deaths, 9,389 were of males and 6,571 of females.

The total deaths from Bowel Complaints show a ratio of 0·85 per 1,000 of population, according to the Census of 1881, against a corresponding ratio of about 1 per mille last year, and a mean ratio of 1·34 for the previous five years.

In the following table the mortality from Bowel Complaints is shown year by year since 1868:—

<i>Years.</i>	<i>Deaths.</i>	<i>Years.</i>	<i>Deaths.</i>
1868	17,823	1875	27,550
1869	30,953	1876	27,271
1870	27,249	1877	17,664
1871	21,678	1878	32,071
1872	23,345	1879	29,612
1873	19,640	1880	20,736
1874	16,407	1881	17,281

The monthly distribution of the deaths from Bowel Complaints will be seen from the statement given in the margin. It will be observed, that the deaths from this class of diseases were, as usual, most numerous in the months of September and October, while the minimum was attained in February and March.

The ratio was highest in the District of Simla, namely, 2·37 per mille; in Kangra it was 1·98; in Jhelum 1·69; Rawalpindi 1·66; in Gurgaon and Hoshiarpur 1·04 each; Mooltan 1·06; Shahpur 1·03; and in Delhi 1·02. In the remaining districts of the Province the death-rate was below 1 per mille.

E.—INJURIES.

33. Under the head of suicide, 306 deaths are reported to have been registered during the year under review, against 263 in the previous year. As in former years, so in the year under report, the female mortality from suicide exceeds the male; thus, in the year 1882, there were 181 deaths of females against 125 deaths of males; in 1881 the proportion was 140 against 123; in 1880 it was 154 against 132.

In the subjoined statement the deaths are classified according to the different modes in which suicide was committed during the years 1881 and 1882:—

Deaths by								1881.		1882.	
								Males.	Females.	Males.	Females.
Drowning	...	...	...	...	...	...	...	20	49	28	93
Hanging	...	...	...	...	...	...	...	59	60	60	54
Poisoning by opium	...	...	...	...	...	...	...	12	11	10	16
Poisoning by arsenic	...	...	...	...	...	...	...	7	3	6	6
Cutting throat	...	...	...	...	...	...	...	1	2	2	1
Stabbing	...	...	...	...	...	...	...	2	...	3	...
Gunshot wound	...	...	...	...	...	...	...	2	...	3	...
Falling from heights	...	...	...	...	...	...	...	4	2	2	2
Setting fire to houses	...	...	...	...	...	...	...	...	...	...	1
Cause not stated	...	...	...	...	...	...	...	16	13	11	8
Total								123	140	125	181

As usual, the modes most commonly resorted to in committing suicide were drowning and hanging, from which alone no less than 125 and 114 deaths respectively were registered.

34. The largest number of deaths were, as usual, registered in the District of Gurgaon, *viz.*, 67, Deaths from suicide highest in *i. e.*, 49 females and 18 males. On enquiries being made from this office the Gurgaon District as usual. from the Deputy Commissioner of Gurgaon regarding the large number of deaths from this cause, the following reply has been received from that officer:—

“With reference to his No. 328, dated 19th April 1883, Deputy Commissioner instituted enquiries with the view of ascertaining the causes of so many suicides in this district, but was unable to elicit anything beyond the fact that there is a similar preponderance of cases in the adjoining State of Alwar, whose population closely resembles that of Gurgaon. The District Superintendent, Police, carefully examined the records of all cases reported as suicides, and ascertained that they were genuine, but could form no opinion as to why the women of this district on the slightest provocation are more prone to jump into wells than elsewhere.”

In Kángra there were 27 female and 9 male deaths from suicide.

35. Under the head of accidents, 3,965 deaths were registered, against 3,955 in the previous year. Deaths from Accidents. The principal causes of accidental deaths, and the mortality due to each, in 1882 and 1881, are classified in the following table:—

Deaths by								1881.		1882.	
								Males.	Females.	Males.	Females.
Drowning	...	...	...	...	...	...	...	1,211	951	1,219	861
Crushed under and falling from roofs, trees, rocks, &c.	...	...	...	...	...	...	...	810	404	825	366
Lightning	...	...	...	...	...	...	...	33	6	32	11
Burns	...	...	...	...	...	...	...	175	181	194	206
Kicks from horses	...	...	...	...	...	...	...	60	15	56	17
Causes not stated	...	...	...	...	...	...	...	9	...	14	9
Causes other than those specified above	...	...	...	...	...	...	...	78	22	127	28
Total								2,376	1,579	2,467	1,498

It will be observed from the above table that of the total of 3,965 deaths registered in 1882, no less than 2,080 were caused by drowning and 1,191 by falling from roofs, trees, rocks, &c.

36. From Snake-bite the deaths registered were 1,014, the number registered in the previous 5 years is as follows, viz :—

Years.	Deaths.
1881	1,012
1880	968
1879	818
1878	752
1877	830

The steady increase of deaths from snake-bite, of late years, necessitates immediate action being taken to destroy poisonous snakes in the Province. His Honor the Lieutenant-Governor was pleased to make the following note in his review of the Sanitary Report for 1873, in respect to the deaths from snake-bites : “ Before concluding, His Honor desires to note that the number of deaths by snake-bite, referred to in para. 115 of the report, and which amounted in 1873 to 967, has long attracted the attention of Government. In all districts, where the number of deaths from this cause is specially great, rewards have been offered for the destruction of the venomous varieties of which coloured models have been furnished to every tahsíl and thána. The result has not yet been very satisfactory, and it is not probable that success will be obtained until the reward now sanctioned by the Supreme Government (2 annas per snake) is considerably increased.” The high death-rate from snake-bite in 1881 and 1882, as compared with previous years, shows the necessity of active measures for the destruction of venomous snakes, more especially in those districts in which the loss of life from this cause is high.

The following table, showing by districts, the total deaths from snake-bite during the years 1878 to 1882, and the mean death-rate per 100,000 of population for the same period, will point out the particular area in which the necessity for such action is most urgent.

Statement showing the deaths from Snake-bite by districts from the years 1878 to 1882 inclusive.

Number.	DISTRICTS.	Population according to Census of 1881.	1878.	1879.	1880.	1881.	1882.	Total.	Mean death-rate per 100,000.
1	Delhi	643,515	19	6	29	15	33	102	3·1
2	Gurgaon	641,348	9	12	24	15	38	98	3·1
3	Karnál	622,621	27	15	25	27	28	122	3·8
4	Hissar	504,183	15	20	28	36	27	126	4·9
5	Rohtak	553,609	16	11	27	24	15	93	3·4
6	Sirsa	253,275	16	12	6	13	14	61	4·7
7	Umballa	1,067,263	19	16	31	29	42	137	2·5
8	Ludhiána	618,835	7	12	11	4	9	43	1·4
9	Simla	42,945	3	...	1	4	...	8	4·6
10	Jullundur	789,555	5	6	14	8	4	37	0·9
11	Hoshiárpur	901,381	26	27	27	27	42	149	3·3
12	Kángra	730,845	42	45	60	43	47	237	6·4
13	Amritsar	893,266	17	10	17	17	21	82	1·8
14	Gurdáspur	823,695	18	24	40	32	39	153	3·8
15	Siálkot	1,012,148	13	15	17	40	41	126	2·5
16	Lahore	924,106	71	89	90	116	90	456	9·8
17	Gujránwála	616,892	59	88	94	100	80	421	13·6
18	Ferozepore	650,519	20	19	29	27	32	127	3·8
19	Rawalpindi	820,512	42	33	49	51	40	215	5·2
20	Jhelum	589,373	34	34	42	44	32	186	6·3
21	Gujrát	689,115	20	19	31	27	16	113	3·3
22	Shahpur	421,508	41	56	45	46	35	223	10·7
23	Mooltan	551,964	38	35	27	42	49	191	6·9
24	Jhang	395,296	33	40	43	45	49	210	10·6
25	Montgomery	426,529	37	53	43	50	66	249	11·7
26	Muzaffargarh	338,605	43	41	33	47	48	212	12·4
27	Dera Ismail Khan	441,649	30	34	34	36	22	156	7·0
28	Dera Gházi Khan	363,346	17	14	16	21	22	90	4·9
29	Bannu	332,577	7	15	12	10	12	56	3·3
30	Pesháwar	592,674	3	4	6	4	5	22	0·7
31	Hazára	407,075	2	8	11	8	9	38	1·96
32	Kohát	181,540	3	5	6	4	7	25	2·7
TOTAL ...		18,842,264	752	818	968	1,012	1,014	4,564	4·8

37. Under the head of hydrophobia, also, the deaths have of late years been very much on the increase; thus, in 1879, the deaths were only 69, in the following year they rose to 107, and in 1881 and 1882 respectively, they rose still higher to 139 and 128. The number of persons killed by wild beasts, &c., was as follows:—viz., 20 by jackals, 10 by wolves, 6 from the stings of scorpions, 5 by boars, and 3 by bears.

38. The total number of deaths registered from all other causes was 129,989. Of this number, Deaths from all other causes. 29,645 deaths were due to cough and chest diseases.

39. The subjoined statement shows the monthly distribution of the mortality from chest affec- Deaths from chest affections. tions during the years 1882 and 1881 :—

Months.				Years.		Months.				Years.	
				1881.	1882.					1881.	1882.
January	...	...	...	3,518	3,008	July	...	...	...	1,608	1,680
February	...	...	...	3,435	2,534	August	...	...	...	1,890	1,810
March	...	...	...	3,185	2,677	September	...	...	...	2,510	2,063
April	...	...	...	2,497	2,007	October	...	...	...	2,792	2,303
May	...	...	...	2,142	2,428	November	...	...	...	2,699	2,914
June	...	...	...	1,800	1,938	December	...	...	...	2,828	4,283

SECTION VII.—VACCINATION.

40. In my report of last year I gave a full account of the introduction of the re-organized vaccine scheme, and I have now only to remark upon the manner in which that scheme has worked during the years 1881-82 and 1882-83. It should be noted here, however, that the Vaccine Report and Returns for 1881 were prepared for the calendar year in accordance with the proposal made in my scheme. But under the recent orders of the Government of India and the local Government, (letter No. 319, dated 4th May 1883) the report and returns are to be prepared in future for the official year ending 31st March, with a view that uniformity may be attained so that the results in the different Provinces might, as far as possible, admit of fair comparison. For this reason I have, therefore, deemed it advisable to change also the returns of 1881 from the calendar to the official year, and beg that these be substituted for those shown in my report for last year.

Total vaccinations performed during the years 1881-82 and 1882-83 by the different vaccination staffs.

41. The total number of persons operated upon during the years 1881-82 and 1882-83 by the different vaccination staff is compared below :—

	1881-82.	1882-83.
Late Provincial Staff ...	140,718	...
District " ...	480,844	467,217
Special " ...	41,732	29,781
Dispensary " ...	7,901	...
Cantonment " ...	2,292	2,699
Total ...	673,487	499,697 *

The cause of decrease in 1882-83 it will be seen is due to the vaccinations performed in certain districts by the late Provincial Staff from 1st April to 30th September 1881 (and which amounted to 140,718) being included in the figures for the 6 succeeding months, ending with 31st March 1882, whereas in 1882-83 no vaccination work was carried on in any district of the Province (except the hill stations) during these months.

The decrease in the Special Vaccination Staff is due partly to the vaccinators in the Western Circle being employed for a time in the Native State of Faridkot, and partly to the returns for March not having been received up to date from the Deputy Sanitary Commissioner of that Circle.

42. The District Vaccination Staff consisted of 27 supervisors † and 256 vaccinators, of which number 40 are 1st, 67 2nd, and 149 3rd Class. The total operations performed by this establishment as shown above were 467,217 or 13,627 less than that performed last year. Out of this number 464,886 were primary vaccinations and 2,331 re-vaccinations. Of the primary vaccinations 442,315 were successful, giving a percentage of 95.14, the re-vaccinations being 45.90 per cent.

The total cost for each operation was 2 annas 9 pies.

43. The following table shows the numbers vaccinated, and the average cost for each operation in each district of the Punjab Province during 1881-82 and 1882-83 :

Table showing the numbers vaccinated, and the average cost.

Serial No.	DISTRICTS.	Number Vaccinated.		Increase.	Decrease.	Average cost per case.		
		1881-82.	1882-83.			Rs.	A.	P.
1	Delhi	12,187	17,363	5,176	...	0	1	11
2	Gurgaon	23,632	14,892	...	8,740	0	1	9
3	Karnál	17,269	14,287	...	2,982	0	2	8
4	Hissar	6,686	10,451	3,765	...	0	2	6
5	Rohatak	10,123	15,404	5,276	...	0	1	4
6	Sirsa	7,440	8,637	1,197	...	0	3	3
7	Umballa	21,474	19,652	...	1,822	0	2	4
8	Ludhiána	23,825	18,126	...	5,699	0	1	10
9	Simla	498	912	414	...	0	3	10
10	Jullundur	26,340	22,962	...	3,378	0	1	10
11	Hoshiárpur	23,685	24,215	530	...	0	1	6
12	Kángra	2,828	5,039	2,211	...	0	3	2
13	Amritsar	16,248	17,902	1,654	...	0	2	7
14	Gurdáspur	22,620	24,386	1,766	...	0	1	7
15	Siálkot	32,823	36,528	3,705	...	0	1	1
16	Lahore	28,090	22,704	...	5,386	0	1	9
17	Gujránwála	20,685	20,645	...	40	0	1	5
18	Ferozepore	17,456	24,646	7,190	...	0	1	3
19	Rawalpindi	24,422	15,496	...	8,926	0	2	4
20	Jhelum	15,025	9,178	...	5,847	0	3	10
21	Gujrát	28,685	24,752	...	3,933	0	1	4
22	Shahpur	14,589	11,264	...	3,325	0	2	9
23	Mooltan	12,602	18,172	5,570	...	0	1	7
24	Jhang	10,552	12,144	1,592	...	0	1	8
25	Montgomery	9,672	9,630	...	42	0	2	0
26	Muzaffargarh	7,465	8,564	1,099	...	0	2	9
27	Dera Ismail Khan	5,036	6,744	1,708	...	0	4	6
28	Dera Gházi Khan,	16,562	7,623	...	8,939	0	3	8
29	Bannu	6,261	6,719	458	...	0	3	8
30	Pesháwar	6,131	5,721	...	410	0	5	10
31	Hazára	4,607	8,841	4,234	...	0	1	10
32	Kohát	5,321	3,618	...	1,703	0	6	11

* In the figures for 1882-83, the vaccinations performed in the Native States of Patiala, Bahawalpur, Kapúρθala, Jhind, Nabha, Faridkot, and Malair Kotla, are not included, vide Punjab Government No. 715, dated 4th October 1882.

† One has now been appointed to the Jhang District.

From this table it will be seen that there has been an increase in 17 and a decrease in 15 districts. A detail of the manner in which the work was performed in each district of the province is attached to this section of my report, and shows that the re-organized scheme has so far been working satisfactorily on the whole.

44. The Special Staff consisted as last year of one Deputy Superintendent and 24 vaccinators. A Work performed by the native supervisor, however, was sanctioned in March 1882 to supervise the work performed by this staff. The total number vaccinated by them was as follows:—

	No. Vaccinated.	Successful.
British territory	... 18,179	17,076
Native States	... 17,773	16,835

45. Under the recent orders of Government, as noted below, the special vaccination staff has been entrusted with the work of carrying on vaccination in the Native States of this Province with the exception of those of Patiala, Bahawalpur, Kapurthalla, Jhind, Nabha, Faridkot and Malair Kotla, in which the Chiefs will make their own arrangements.

COPY of a letter No. 475, dated 3rd July 1882, from the Secretary to Government, Punjab, to the Sanitary Commissioner, Punjab.

I am desired to acknowledge receipt of your letter No. 1479, dated 29th May, regarding the prosecution of vaccine operations in Native States.

2. Sir Charles Aitchison entirely sympathizes with your wish to prevent the neglect of vaccination in the Native States after it has been successfully carried out in them for a long series of years and is willing to take measures for inducing the Chiefs to carry on these operations where they have been already instituted, and to institute them where no beginning has yet been made.

3. The Lieutenant-Governor does not think it would be practicable to provide for vaccination in the larger Native States being carried on in connection with the provincial arrangements. Most of these States already maintain establishments of their own, and all that is necessary is that you should report cases in which the disease has been imported from the territory of such States into British territory, in order that the importance of the subject may from time to time be brought to the notice of the Chiefs. But the Lieutenant-Governor will have no objection to bringing the smaller States within the scope of the Provincial operations. Many of these States are of very limited area and resources, and it may be advisable to continue the assistance which has hitherto been rendered to them by Government in promoting vaccination.

Before taking further action, the Lieutenant-Governor would wish to be furnished with some account of the work which has been done during the past 3 years in the smaller Native States, and with statistics of the establishment employed, the number of persons vaccinated, and the cost of the operations. The proposals which you would make for carrying on vaccination in future within their limits can, at the same time, be explained, due regard being paid to the remarks contained in my No. 288 of 14th April 1882, regarding the local character of the establishments paid from Municipal or District funds, and the necessity of meeting from the Provincial revenues any expenditure which cannot be borne by the States themselves.

COPY of a letter No. 2098, dated 7th September 1882, from the Sanitary Commissioner, Punjab, to the Secretary to Government, Punjab.

With reference to your letter No. 475, dated 3rd instant, and previous correspondence as noted in the margin, on the subject of carrying on vaccination in Native States, I have the honor to offer the following remarks and suggestions:—

Para 11 of revised Vaccine Scheme. Punjab Govt. No. 288, dated 14th April 1882.

No. 1479, dated 29th May, with enclosure, from Sanitary Commissioner, to Secretary to Government, Punjab.

2. Your letter under consideration conveys in general terms the views of His Honor the Lieutenant-Governor in regard to the promotion of vaccination in the smaller Native States, and the agency through which it should be conducted. At the same time it states that before any further action can be taken by Government in the matter I should furnish, along with my proposals, "some account of the work which has been done during the past three years in the smaller Native States, and with statistics of the establishment employed, the number of persons vaccinated, and the cost of the operations."

3. In accordance with these instructions I beg to forward the accompanying statements compiled from the annual printed returns, appended to the three last reports of the late Provincial Vaccination Department, which afford all the required information ; a summary of which is as follows :—

	1879-80.	1880-81.	1881. (6 months).
Number of Native States in which vaccination operations were conducted	15	17	12
Average number of Provincial vaccinators employed for the purpose in each year	5	5	4
Number of persons vaccinated	39,988	32,971	35,951
The cost of each operation	not avail- able.	not avail- able.	not avail- able.

In this table, owing to my being unable to distinguish with accuracy the larger from the smaller Native States, I have not excluded the Native States of Patiala, which, up to the present time, appears to have been to some extent under the supervision of the late Provincial establishment, inasmuch as the vaccination operations performed in it, by the Provincial vaccinators, are included in the returns of the Department.

4. In para. 11 of my revised vaccine scheme, copy of which was again recently forwarded to you under cover of my letter No. 1,479, dated 29th May 1882, I detailed at length the plan in which I proposed vaccination should be carried on in Native States. These proposals, it will be seen, had reference to all Native States, and will now have to be somewhat modified in order to meet the wishes of His Honor the Lieutenant-Governor as expressed in your letter under reply. The two points which now seem to me to require consideration are :—

- (1). What Native States should be brought under the scope of the Provincial arrangements ?
- (2). What establishment will be considered necessary to conduct the operations ?

5. In regard to the first point, the Census tables of the recent Census, forwarded to me by Mr. Ibbetson, Deputy Superintendent of Census Operations, will enable us to separate the larger from the smaller States. Statement No. I of the Census Returns shews that altogether there are 36 Native States in the Punjab Province with a population of 3,861,683. Of these there are 10 in the Eastern plains, only one in the Western, and the remaining 25 are classed as Hill States. I append two statements marked A and B, the former shews the names and population of all the Native States in the Eastern and Western plains, and the latter those of the Hill States. The Hill States may, without any further remark, come under Provincial operations, but in regard to those in the Eastern plains, I should like to be informed which of them are considered large and which small, by the Government.

I should classify them as follows :—

LARGE NATIVE STATES.						SMALL NATIVE STATES.					
Name.					Population.	Name.					Population
<i>Eastern Plains.</i>						<i>Eastern Plains.</i>					
Patiala	...	...	...	...	1,467,433	Faridkot	...	...	...	...	97,034
Nabha	...	...	...	...	261,824	Malair Kotla	...	...	...	...	71,051
Kapúrthala	...	...	...	...	252,617	Kulsia	...	...	...	...	67,708
Jhind	...	...	...	...	249,862	Dujana	...	...	...	...	23,416
<i>Western Plains.</i>						Pataudi	...	...	...	...	17,847
Bahawalpur	...	...	...	...	573,494	Loharu	...	...	...	...	13,754
						25 Hill States	...	...	...	...	765,643
Total					2,805,230	Total					1,056,453

If this distribution is approved by His Honor the Lieutenant-Governor, then the next point to be considered is what establishment will be required to conduct the operations in them.

6. The population that I propose should come under the supervision of this Department, it will be seen, is 1,056,453, which is equal to that of the British population of the Siálkot District. The vaccination staff sanctioned in the revised scheme for this district is, one Native Supervisor on Rs. 40, two 1st Class Vaccinators at Rs. 15 each, three 2nd Class at Rs. 12 each, and nine 3rd Class at Rs. 10 each, total 14 vaccinators and 1 Native Supervisor. The expenditure being only Rs. 196 per mensem for this establishment.

I think, therefore, that a staff equal to that of this district would be sufficient to carry on vaccination efficiently in all these Native States.

7. You will observe that all the Native States I propose to bring under the supervision of this Department are in the jurisdiction of the Deputy Sanitary Commissioner of the Eastern Circle. The present Provincial Staff consists of 24 vaccinators, viz., 12 in the Eastern and 12 in the Western Circles. In the Western Circle there are no smaller Native States, and, so far as I know, the vaccinators are not so hard worked as those in the Eastern Circle. I would therefore propose, with a view to avoid any further expense in the Provincial revenues, to transfer 4 vaccinators, viz., one 1st Class, one 2nd Class and two 3rd Class from the Western to the Eastern Circle, and appoint Deputy Superintendent Bal Kishn to supervise the operations in these States. The vaccination staff, according to the above proposals will be as follows:—

EASTERN CIRCLE.				WESTERN CIRCLE.			
		Rs.	A. P.			Rs.	A. P.
1	Native Deputy Supdt. ...	150	0 0	1	Vaccinator @ 15 ...	15	0 0
	Fixed Travelling Allowance	45	0 0	3	" @ 12 ...	36	0 0
1	Native Supervisor ...	40	0 0	4	" @ 10 ...	40	0 0
3	Vaccinators @ 15 ...	45	0 0				
5	" @ 12 ...	60	0 0				
8	" @ 10 ...	80	0 0				
	Total ...	420	0 0		Total ...	91	0 0

or Rs. 40 only in excess of that already sanctioned by Government.

8. In conclusion I would remark, in reference to para. 2 of your letter in which you state that the "Lieutenant-Governor does not think it would be practicable to provide for vaccination in the larger Native States being carried on in connection with the provincial arrangements, * * * * and all that is necessary is that you should report cases in which the disease has been imported from the territory of such States into British territory," that since most of these States already maintain establishments of their own, would it not be possible for them to submit to this office, in the prescribed form, a monthly return of the work performed in each vaccinating season. This information is already supplied by the Bahawalpur State, and if all the others were to do so also, it would be, I need not add, of very great use to the Department.

COPY of a letter No. 715, dated 4th October 1882, from the Secretary to Government, Punjab, to Sanitary Commissioner, Punjab.

I am desired to acknowledge the receipt of your letter No. 2,098 of the 7th September, regarding the prosecution of vaccine operations in Native States.

2. The Lieutenant-Governor agrees in your opinion that the large States of Patiala, Bahawalpur, Jhind, Nabha, and Kapurthala should be left to make their own arrangements in regard to vaccination, and His Honor would further include in this list the States of Faridkot and Malair Kotla. The Chiefs of these States will be informed accordingly, and will be invited to communicate from time to time the arrangements made for vaccination within their limits and the number of persons annually vaccinated. This information when received, will be communicated to your office.

3. In the remaining States the Lieutenant-Governor thinks it desirable that vaccination should be carried on in connection with the Provincial establishment. A list of these States is given in the enclosure to this letter. In order to enable you to render the assistance required in the case of these States, the Lieutenant-Governor is pleased to sanction the arrangement proposed in para. 7 of your letter, and the Provincial establishment allotted to the Eastern and Western Circles, respectively, will in future be as follows:—

EASTERN CIRCLE.				WESTERN CIRCLE.			
		Rs.	A. P.			Rs.	A. P.
1	Native Deputy Supdt. ...	150	0 0	1	Vaccinator @ 15 ...	15	0 0
	Fixed Travelling Allowance	45	0 0	3	" @ 12 ...	36	0 0
1	Native Supervisor ...	40	0 0	4	" @ 10 ...	40	0 0
3	Vaccinators @ 15 ...	45	0 0				
5	" @ 12 ...	60	0 0				
8	" @ 10 ...	80	0 0				
	Total ...	420	0 0		Total ...	91	0 0

4. The Commissioners of Delhi, Hissar, Umballa and Jullundur will be addressed with a view to this arrangement being carried out in communication with your Department in the States under their respective control :—

UNDER.			STATE.
Commissioner, Amritsar	...	Chamba.	
Do. Umballa	...	Kalsia and Simla Hill States :—	
		(1) Sirmur. (2) Bilaspur. (3) Bashahr. (4)	
		Nalagarh. (5) Keonthal. (6) Bhagal. (7)	
		Bhagat. (8) Jubbal. (9) Kumharsain. (10)	
		Bhajji. (11) Mailog. (12) Balsam. (13) Dhami	
		(14) Kuthar. (15) Kunibiar. (16) Mungal	
		(17) Bija. (18) Darkuti. (19) Tarsch. (20)	
		Sangri.	
Commissioner, Jullundur	...	Mandi and Suket.	
Do. Delhi	...	Pataudi.	
Do. Hissar	...	Loharu and Dojana.	

46. On my inspection of the City of Amritsar, I made the following proposal to Government
 Proposal for having fixed in regard to having fixed stations in that town for performing vaccinations
 stations in Municipal towns and also recommended that it be made general throughout the Province.
 for performing vaccination.

"I suggested to the members of the Municipal Committee that most of the causes of complaint and inconvenience alleged against the system of vaccination as at present carried out, might be at once removed by the adoption of measures which I explained in detail. The most important of these measures is the establishment of fixed stations in different parts of the city at which the vaccinators should attend on fixed days and hours with their selected vaccinifers for the vaccination direct from arm to arm of the children to be thus protected, and who should be brought to these stations for this purpose on the days and hours fixed by previous arrangement. The vaccinators should be provided with counterfoil books of tickets for vaccination. These tickets should bear the name of the child to be vaccinated, the name of the father, and the child's age ; and the date and place at which it is to be vaccinated should be entered at the time the ticket is given to the parents. When the operation is performed the date should be entered on the ticket and the counterfoil, and the date on which the child is to be again brought for inspection to the vaccination station should be now entered on the parent's ticket, and he should be warned to present the child for inspection on the date entered. On this latter date the vaccinator should enter on the ticket as well as the counterfoil the result of the operations. By this method much trouble, inconvenience, and loss of time would be avoided, but to ensure its success the people must co-operate with the vaccinators. The members of the Municipal Committee expressed their approbation of the method I proposed for their adoption, and promised to give it a trial. I would suggest, however, that the Municipal Committee be invited to hold a special meeting at an early date for the purpose of considering this subject and giving practical effect to its details.

I would also beg to be informed of the steps finally taken by the Municipal Committee in this matter."

The proposal was accepted by His. Honor the Lieutenant-Governor and orders were issued by Circular to all Commissioners, with a view that the same should be carried out as far as practicable, in all Municipal towns.

47. In some Municipal towns I have been informed vaccination cannot be performed in fixed stations unless Act XXIV (The Vaccination Act) is made compulsory. On this subject the
 Compulsory vaccination in Municipal towns. local Government in its review of the Vaccination Report of the Punjab for 1870-71 stated that "the importance of vaccination and the protection it affords against small-pox should be most strongly urged upon the people by the officers of Government and intelligent native gentlemen, but the Lieutenant-Governor is altogether opposed to make vaccination compulsory. Its benefits are so clear that in time they must be recognized by the people of the whole Punjab as the present report shows them to have been recognized by the inhabitants of some of the Hill States. The Lieutenant-Governor is content to await the time when vaccination shall be generally accepted by the people, and considers that to make it compulsory would do more harm than good to the movement." Consequently the subject was not again revived until very lately when the Amritsar Municipal Committee proposed that vaccination be made compulsory in their city, I have reason now to believe that several Municipal Committees are desirous that the provisions of the Act should be extended in their towns, and I shall be glad when the opportunity is afforded me of recommending all such proposals inasmuch as more than a decade has passed since the above remarks were expressed by the Government and in this interval of time vaccination has undoubtedly become more popular, and could I think now be made compulsory without much opposition.

48. Dr. O'Neill, Deputy Sanitary Commissioner, Eastern Circle, has furnished the follow-
 Dr. O'Neill's report on ing very interesting report on his experiments in regard to the preservation
 preservation of lymph. of lymph :—

"This year during the summer season, very great pains were [taken to store a sufficient quantity of good lymph for use in the plains during the vaccination season, for the unsatisfactory cicatrices I

referred to in my Vaccination Report for 1881, I considered attributable to the imperfect quality of the lymph in use. During this summer I filled with my own hands over three hundred tubes, and not a single tube was filled by a vaccinator; and there is no doubt any one who wishes to store lymph ought, if possible, do it himself rather than entrust the task to vaccinators, who, as a rule, look more to the quantity than the quality of the lymph they are able to send. Four men of the Special Staff remained with me to procure vaccinifers, while the remainder of the staff worked in the Native States bordering on the European stations and were mainly supervised by Pandit Bal Kishn, Deputy Superintendent of Vaccination, who, later on, as the season came to a close, assisted me by vaccinating children in proximity to my camp. I commenced to store lymph about the middle of August, and this was by no means too early, for owing to various accidents, several opportunities of storing lymph were lost; for instance, it sometimes happened that only five or six children could be procured and none of the vesicles was first class, again, I did not like to congregate the children in a dense fog and a heavy rain, not to mention that I sometimes did not myself feel inclined to go three or four miles in the rain to fill tubes; and owing to exposure to the sun, I became so ill that I lost lymph on three or four days. Three lymphs were kept up, thus lymph was started on Sunday, Tuesday, and Thursday; these were ready respectively on Saturday, Monday and Wednesday, so that, if one failed there were two others remaining, and that which failed was replaced as soon as possible. The vaccinators I kept with me were instructed to produce large vesicles either by scarification or punctures close together, and the vesicles produced were certainly very fine. Owing to recent instructions, however, the method of multiple punctures will in future be abandoned.

While engaged in filling tubes a few matters of interest arose, which as they were quite new to me will be here dwelt on at length.

At first it was my custom to open the vesicle of one child only at a time and seal each capillary tube before charging the succeeding one. It seemed, however, that if the vesicles of three or four children were opened at the same time, all the tubes might be first charged, and the children being allowed to depart, the tubes could be sealed at leisure; for making the lymph pass down into the tube before charging a second tube would cause considerable delay in the work, and if it were done quickly it would be certain to cause an accident which will be referred to later on. When I came to shake the lymph down into the middle of the tube preparatory to sealing, I found the lymph adhered so strongly to the glass that it was with difficulty it could be made to pass down the tube. Seaton, in his Handbook of Vaccination, page 148, thus gives the words of Dr. Husband, 'It should be observed, that in no case is a tube to be laid down until the lymph has been made to pass towards the middle of it, for the fluid concretes quickly about the orifice, and you cannot afterward detach it without difficulty.' Accepting this as the reason of the difficulty I met with, on the next occasion I charged the tubes just as before, putting each aside as soon as it became charged without making the fluid pass towards the middle of it, and when the time for sealing arrived, I broke a minute portion of the tube sufficient as I thought to detach the concretion which had been caused by the drying of the lymph, but to my surprise, while separating the fragment I had broken off from the main portion of the tube, I drew out from the latter a filament the length of the charged portion of the tube, and which I believe to be fibrin. This filament or thread appeared like a spider's web glittering with the morning dew. It was laden with drops of lymph, and when the fragment and tube were approximated, the thread by its elasticity retreated within the tube, and when it was again withdrawn, it came forth free from drops. The filament I believe to be fibrin, because it is a spontaneously coagulated substance.

It is perfectly clear and is invisible in the tube, though while it is being drawn out its distal end can usually be followed by a minute air bubble attached to it.

The best way to remove the fibrin is as follows :—

Hold the tube by the thumb and forefinger of the left hand quite close to the orifice by which the lymph entered, then with the forefinger and thumb of the right hand gently break off the smallest possible portion of the tube steadied by the left hand, and slowly separate the fragment from the tube and the thread is drawn out. If the separation is rudely made, the thread is broken. It is well, when the fragment has been separated a little from the tube, to let the tips of the right forefinger and thumb close on the thread and hold it, otherwise it is likely to part from the fragment and retreat into the tube. Sometimes the filament breaks; it then generally goes back into the tube, but a portion of it may remain outside clinging to the glass. On account of its pellucid nature, it cannot be seen while it is in contact with the tube, but if the end of the tube is gently drawn between the finger and thumb the portion clinging outside may be caught, and then by traction the whole of the fibrin may be removed. Should it not be possible in this way to regain the end of the last thread, it will be necessary to break off another fragment of tube just as before. The fibrin shortly after coagulating is as clear as water, and it can be seen only by holding it in a favorable position between the observer and the light.

At first I imagined the presence of this coagulated substance in the tube shewed the lymph was bad, but it was afterwards seen that no matter what sort the vesicle might be fibrin could be removed as I have described from its lymph, though the amount is by no means constant, for the more thick and viscid the lymph the more abundant the fibrin, while thin and watery lymph possesses it only in a minor degree. In fact, fibrin is the cause of the viscosity of the lymph.

When the fibrin is removed from the tube, the remaining lymph is as clear as water, the faintest turbidity is not apparent. Of course, pure lymph is also clear, still it does not transmit the light as fully as when the coagulated fibrin in the tube is removed. Even though the fibrin is still clear and has not

as yet from age become turbid. The defibrinated lymph is not only clear but also almost free from viscosity, and very gentle tapping of the tube is sufficient to make the lymph pass towards the middle of it; in many cases it will run down the tube itself, in all cases when it has been made to moisten the tube throughout its entire length it can be made to rapidly run from one end to the other by simply inverting the tube.

Fibrin may be removed almost immediately after the tube has been charged, but it is best to wait for about five minutes to allow the whole of it to coagulate. The removal of it reduces the contents of the tube by about one-third, therefore, in storing defibrinated lymph it is well the tubes should be first nearly half filled, so that when the quantity is reduced by removing the fibrin there may still be a fair amount left.

But it may be asked, granted there is fibrin in vaccine lymph, what is to be gained by removing it? The answer is the better preservation of the contents of the tube. If stored lymph is examined from day to day it will be seen that at first a cloudiness sets in throughout the length of the lymph, but not throughout its entire thickness; after a time when the cloudiness has become more marked, it will be seen to assume the character of a thread which steadily grows whiter and eventually the whole contents of the tube become cloudy, and when blown out on a polished black surface or a piece of glass backed with black cloth, the white coagulated thread can be readily seen. Now this substance is fibrin, and though it is possible it does not altogether lose its vitality by the mere act of coagulating,—for we know it coagulates almost immediately on entering the tube,—still it is extremely probable that when instead of remaining clear it becomes cloudy and subsequently opaque it has lost its vitality and is not only powerless for good, but likely to set up destructive changes in the liquid which surrounds it,—changes which might have been obviated if the fibrin had been removed before the tube was sealed.

In Seaton's Handbook of Vaccination we read at page 149 'At first sight it might appear that the lymph in capillary tubes, existing apparently in exactly the same condition as at the moment when it was taken from the vesicle, should not differ materially in its efficacy from lymph transferred direct from arm to arm; but this is far indeed from being the case. Whether it be that the heat employed in the process of sealing produces some action upon the lymph, or whether by keeping in the liquid state it liable to undergo molecular changes quite certain it is that tube vaccination does not even approach the success of vaccination from arm to arm.' Again at page 149 note, 'Whatever the changes may be that lymph undergoes by storage in capillary tubes, they must take place either in the act of storage or very soon after, for it seems quite established that lymph stored in tubes is not affected by length of keeping * * * * * I cannot but strongly suspect that the heat necessary for hermetically sealing *does* exercise an injurious influence * * * * *'

The presence of fibrin in lymph clears up all the doubt expressed in the above quotation. It is now seen that lymph in tubes does *not* 'exist apparently in exactly the same condition as at the moment it was taken from the vesicle,' and one could expect it to differ materially in its efficacy from lymph transferred direct from arm to arm. In arm to arm vaccination we use *pure lymph*. With tubes we use not vaccine lymph, but *vaccine lymph minus its fibrin*, for the fibrin having coagulated may be looked upon as inert, and as the latter lymph wants a constituent of exceeding value its inferiority as a vaccinating agent is a necessary consequence. The author quoted is quite right when he supposes the change in the lymph takes place 'in the act of storage or very soon after' for that is just the time when the fibrin coagulates, though he is not altogether right in suspecting the change is due to the heat used in sealing the tubes. Stored lymph is equivalent to defibrinated lymph, at least lymph stored in tubes is. When tube lymph is used the vesicle produced is always small, but small though it be it contains some fibrin, and by successive transmissions this principal is increased till eventually by proper care on the part of the vaccinator a well-developed vesicle is produced rich in fibrin. I am not prepared to say that a bad lymph stock can be made good by careful transmissions, I merely maintain that the best lymph stored in a tube by the very act of storage loses a most valuable principal, but still this impaired lymph if carefully transmitted through well-selected vaccinifers, will steadily improve till it at length it regains in richness as much fibrin as it lost when first stored, but for this object to be obtained all the transmissions must be from arm to arm.

Experience shews that if it be necessary to store lymph for a short time, only well-charged points and glasses are preferable to tubes, these being most of use when the lymph is to be stored for a considerable time. This seems to me to be owing to the intimate admixture of the lymph and its fibrin when allowed to dry on points or glasses, the fibrin is uniformly distributed over the dried lymph, and is inseparable from it, so that when the dried lymph is scraped from the glasses or rubbed in by means of the ivory points, the fibrin it contains is also inserted with it, and they are both inserted together.

In the case of the tube lymph its fibrin by coagulating separates itself from the serous portion of the lymph in the form of a string and so cannot be inserted at the time of vaccination. The rapid deterioration of dried lymph I think is due to the influence of the atmosphere, so that if we can store *dried lymph in hermetically sealed chambers* with a minimum quantity of enclosed air, we will have a more perfect system of storage than any now in use. But inasmuch as the fibrin even in dried stored lymph has coagulated no method of storing lymph will give as successful results as the arm to arm method. In the cases of dried lymph the fibrin it contains is inserted in vaccination, and though it is not like the uncoagulated principle used in arm to arm vaccination, still sufficient time has not elapsed for it to undergo complete change, and I think it is possible the coagulated fibrin merely by its coagulations does not become inert, though no doubt these destructive changes are more likely to be produced when the fibrin is surrounded by moisture than when it is retained in a dry state and free from contact with air.

There is another method of removing the fibrin from lymph besides that described, *viz.*, by blowing the contents of the tube on a piece of glass, having first allowed sufficient time for the fibrin to coagulate in the tube, and having removed the fibrin by drawing the point of a needle across the lymph, allow the lymph to again enter the tube. Blowing out the lymph is not recommended as the tube is by this means filled with the impurities of expired air, but a syringe or a small India rubber ball might be used. There is, however, considerable waste in blowing out the lymph on glass and taking it up again.

I think it is possible, stores of lymph in England occasionally remove the fibrin from the lymph either accidentally or intentionally, for on the arrival of tubes in this country, though in the great majority of cases I can draw out the pellucid string of fibrin, in other cases the string is extremely fine or entirely absent. In the latter case the lymph must have been defibrinated or have been originally thin, watery and consequently bad.

But a very remarkable fact is that fibrin or any spontaneously coagulating substance does not exist in small-pox lymph. This is very strange and quite opposed to what one would imagine from the allied nature of the diseases vaccinia and variola. Fibrin does not exist in the lymph of chicken-pox as I have ascertained, but that it does exist in small-pox lymph points out a striking difference between it and vaccine lymph. It was with the greatest difficulty I obtained suitable cases of small-pox to satisfy myself on this point, but I filled a sufficient number of tubes to make certain that the matter is as I have above stated. I think if I were permitted to spend some time in Bombay where animal vaccination is practised, where small-pox now prevails, and where a small-pox hospital brings within reach plenty of patients for the examination of disease, I would have a splendid field for investigation and research.

Another matter not fully referred to in works on vaccination is the formation of air bubbles in tubes. It is generally supposed bubbles are formed when the orifice of the tube is not throughout its entire circumference in contact with lymph and so allowing lymph and air to enter together. It is quite possible bubbles may be formed in this manner; but several tubes perfectly free from bubbles and sealed with my own hands were the next day found to contain as many as seven or eight large bubbles, clearly proving that bubbles or the beaded appearance caused by air and lymph may be produced after the sealing of the tubes. A few experiments settled the question. If lymph is strongly driven towards the middle of the tube the greater bulk runs down, but some remains adherent to the sides, and owing to friction but slowly flows down; now, if when the greater portion of the lymph has been driven down, the tube is at once changed from the vertical to the horizontal position, the fluid which lines the tube will by gravity descend in a direction transverse to the long axis of the tube, and instead of joining the main body of the lymph, will in a short time at nearly regular intervals of space present the appearance of constrictions which gradually increase till the nearest points of the constrictions coalesce and the beaded appearance is produced. If a tube be partly filled with water and then treated as described, numerous bubbles will be formed giving the glass tube a beaded appearance. To prevent this breaking up of the column of lymph, it is only necessary to be careful that the lymph is *gently* shaken down, and that the tube is kept for about a minute in a vertical position to allow time for the lymph attached to the sides to flow down to join the main body of the lymph. If the tube be now sealed, bubbles will not be formed nor will air have got mixed up with the lymph.

The arrangement made for starting lymph in the districts was as follows:—On 23rd September three tubes were sent to each Civil Surgeon with a request he would use the lymph on receipt. Three days after a second supply of three tubes was, unasked, sent to each officer, and this he was also requested to use without delay. The object was that each officer might have at the same time two lymphs in his district with an interval of three days between them, so that if the first supply failed he would have a second almost at maturity to fall back on. As soon as the Civil Surgeon reported a supply failed, I at once sent him another, but if before it arrived the second lymph proved successful, he could at once commence vaccine operations, whereas if it failed also, he could report its failure when I would send him a fourth supply though at the time his third supply might be near maturity. When he reported that vesicles were produced I ceased supplying him. In some districts the arrangement was intelligently carried out, but in others the second supply was not used till the result of the first was seen, and the third was not used till the result of the second. Of course in this way there was time lost. I am strongly of opinion many of the failures reported were due to the carelessness of the vaccinators who shrewdly reasoned that a failure of lymph would give them an additional week's rest; but it is quite possible the inactivity of the lymph was the cause of its failure, though as I have said I exercised the greatest care in selecting vaccinifers and charging tubes. With each supply of lymph a printed form for report was sent which, with very few exceptions, was filled in and returned.

The following list shews the supply with which lymph was started in each district:—

The first supply succeeded in—

Delhi, Gurgaon, Hissar, Rohtak, Sirsa, Hoshiárpur, Siálkot, Chamba and Bhurtpur.

The first failed, but the second succeeded in—

Jullundur, Amritsar and Gurdáspur.

The first and second failed, but the third succeeded in—

Karnal and Umballa,

and a fourth supply had to be sent to Ludhiana. In two cases, amongst the latter mentioned districts, I sent vaccinators from the Special Staff to start the lymph, a proceeding which the vaccination staff of those districts did not relish, for they treated the officer of the Special Staff with scant courtesy, and plainly informed him they were quite as well able to start lymph as he was. Anyhow, lymph was started, and I do not know a better way of employing the Special Staff than directing members of it to proceed to those districts where the District Staff fails repeatedly to raise vesicles. It should be stated no supplies were sent to Simla and Kangra, as vaccination is continuous in those districts.

From the above it may be seen the failure of the lymph cannot be attributed to heat, as some of the districts in which the first supply was successful are quite as warm as those in which the results were not so satisfactory.

The quality of the vaccination in the circle is a subject I approach with the greatest pain. I believe it is nearly everywhere lamentably inferior, and that only a small percentage of the population has obtained the full protection careful vaccination affords. This view is nearly altogether founded on the kind of cicatrix produced which in the immense majority of cases is perfectly superficial and seems to be nothing more than a mere discoloration of the skin. Why the cicatrix should be so bad it is hard to say, but probably there are many reasons. Under the present system of vaccination lymph is almost certain to deteriorate and that rapidly, and one of the most powerful causes in bringing about this deterioration is the desire to show large returns. Large numbers are considered as a test of good work, at least by Government, who is always careful to compare the numbers vaccinated one year by those of the preceding year, and thinks everything goes on well if the cost of each case of vaccination shews a diminution on the expenditure of the previous year. To bring about high numbers I monthly informed the Civil Surgeon of the numbers vaccinated in the first three districts, that they may be stimulated to greater efforts. Frequently the vaccinifers are too few for the numbers to be vaccinated, but sooner than let the children go away unvaccinated, the operator will use the lymph of vesicles that are almost completely drained. I almost fear to say how many children are vaccinated from a single vesicle, and I think it is an exceedingly rare occurrence for vaccinators to send children away because the vaccinifers are too few, rather would they prefer to use a most inferior vesicle. Frequently the vaccinator has no choice but to take lymph from an inferior vesicle or let his lymph die out and vaccination come to a standstill, and he will certainly prefer the former to the latter on account of the bad name the latter would procure him. On these accounts the vesicle rapidly deteriorates unless the greatest care and supervision is exercised. If the protective influence of the vaccination is to be determined by the nature of the cicatrix, then vaccination in the Eastern Circle is bad.

But perhaps the smooth cicatrices we see are not altogether attributable to the fault of the vaccinators, but are a necessary consequence of vaccination in India owing to climate and race. Seaton says page 267, Handbook of Vaccination, 'The protective influence of vaccination extends to all climates and races;' and the Small-pox Commissioners appointed by the Indian Government in 1850, say, 'It is the opinion of every medical man we have consulted, and we believe it is that of every educated man in India, that when properly and successfully conducted, vaccination is just as efficient a safeguard here as it is in England.'

But under the most favorable circumstances the difficulty of keeping up an active supply of lymph is far greater than in England on account of climate, and it is possible that the defective cicatrices produced by vaccination in this country is not altogether independent of race. With reference to climate we know the invariable rule in the Punjab, which has a cooler winter than any other province, is to use *seven* days' lymph instead of *eight* days' lymph as is the custom in England. In England, if a child be vaccinated on Monday, lymph is taken from it the following Monday, for on that day the vesicle is mature and the arcola is not developed; in India, on the other hand, lymph must be taken a day earlier for the vesicle has an arcola on the day or week after the vaccination, and the lymph is thin and watery, and vaccination with it is attended by many failures. Now this shews the vesicle runs a more rapid course in India than it does in England by a day, and the rapid maturation of the vesicle is one of its most unfavourable signs. I have heard on good authority that high, up amongst the snows, the vesicle does not mature till the eighth day, and that it is there large and well-developed. During the summer I tried to vaccinate with eighth-day lymph, but the failures were numerous, and the vesicles produced afforded a scanty supply of lymph, and I am not aware that anywhere in the plains lymph is taken on the eighth day.

And now for a few remarks on race. It is by no means a new proposition that vaccine lymph does not produce on dark races the full effect it does on the fair races, and lately practitioners in the West Indies have testified to the difficulty in transmitting vaccine lymph through the Negro race. I have myself repeatedly observed that the best vesicles are in the great majority of cases produced in fair or light-colored Asiatics, the dark children sometimes, but not as a rule, give good vesicles; and when engaged in storing lymph, I directed my vaccinators to always first vaccinate the fair-complexioned children, and if any lymph remained, then to vaccinate their duskier brethren. The best cicatrices are also found on fair children, and the well-marked, faveolated cicatrices I have at any place chanced to see were nearly always on the arms of light-complexioned children; so there is certainly some ground for the belief that race exercises an influence on the course of vaccination. Climate and race tell against vaccination in India, then how doubly careful is it that we should exercise the greatest care in carrying on

our operations, more especially when we remember the agency we employ in this country is greatly below that of England in care, skill and intelligence, and the method of vaccination in the Punjab is to be a single puncture instead of the approved English method of scratches, tatooing or multiple punctures."

DELHI DISTRICT.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	1
First Class Vaccinators	...	...	...	...	...	2
Second „	„	...	...	...	...	3
Third „	„	...	...	...	...	5

Work performed during the year.

Population	...	...	...	...	...	643,515
Average population per square mile	...	...	...	...	...	496
Total vaccinations	...	...	...	...	...	17,363
Successful cases	...	...	...	...	...	16,103
Percentage of successful cases	...	...	...	...	...	94.30
Persons successfully vaccinated, per 1,000 of population	...	...	...	...	...	25.23
Average number vaccinated by each vaccinator	1,736.30

Rs. A. P.

Cost of each successful case	0 1 8
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It is much to be regretted that the Civil Surgeon has not submitted any report on the working of the vaccine establishment under his charge. The only remark Dr. Ross makes on the subject is that "Vaccination is done in a very perfunctory manner." The Deputy Commissioner justly considers this "a very unsatisfactory remark and one calling for the active interference of the Civil Surgeon." Dr. Ross does not seem to have taken a lively interest in the vaccination work of his district. Indeed, his own remark condemns his conduct in the matter.

GURGAON DISTRICT.

Vaccination Establishment.

First Class Vaccinator	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	3
Third „ „	...	...	...	...	...	5

Work performed during the year.

Population	...	...	...	...	...	641,848
Average population per square mile	...	...	...	...	...	348
Total vaccinations	...	...	...	...	...	14,892
Successful cases	...	...	...	...	...	14,353
Percentage of successful cases	...	...	...	...	...	96.65
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	22.42
Average number vaccinated by each vaccinator	1,654.66

Rs. A. P.

Cost of each successful case	0 1 7
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The Civil Surgeon of this district also has given no remarks whatever regarding the working of the vaccine establishment; but it will be seen from the above figures that, compared with Delhi, his establishment was far more active, and the outturn of the work considerably more successful.

KARNAL.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	1
Second Class Vaccinators	...	...	...	...	...	3
Third „ „	...	...	...	...	...	5

Work performed during the year.

Population	...	...	...	...	622,621
Average population per square mile	...	...	...	...	264
Total vaccinations	...	...	...	...	14,287
Successful cases	...	...	...	...	12,805
Percentage of successful cases	...	...	...	...	89.67
Persons successfully vaccinated per 1,000 of population	...	...	...	...	20.57
Average number vaccinated by each vaccinator	...	...	...	...	1,587.44
					Rs. A. P.
Cost of each successful case	...	...	...	...	0 1 3

The report on the working of the vaccine establishment in this district is so interesting and full that I have thought it necessary to give the whole of it *in extenso* in this place.

“ At the end of September last the whole of the vaccinators including Khushal Singh, the Native Supervisor, were recalled to head-quarters to commence vaccine operations. I had previously carefully studied the system adopted last year by Surgeon B. Doyle for the working of the vaccination staff, and having also received and heard more than one complaint during the hot weather about the uselessness of vaccination, a report being current that several children at Panipat who had been successfully vaccinated during the last cold weather had not only contracted, but actually died of small-pox, I came to the conclusion that something must have been faulty in the arrangements, I being totally unable to lay my hand on any particular vaccinator and accuse him of tampering with his returns. I may mention, however, that I was not willing to accept a native rumour as necessarily true. I believed it to be quite possible that the children supposed to have died of small-pox may in reality have died from some totally different disease, or it may have been possible that the children attacked had been vaccinated unsuccessfully and returned as ‘successful.’ I regret I was unable, during the epidemic of small-pox at Panipat during the last hot weather, to verify any of the cases which were supposed to have died of the disease after having been successfully vaccinated the year before, as I did not receive the news for some time after the child was dead and buried.

The system of work adopted during the cold weather of 1881-82, was as follows :—

The whole of the vaccinators worked in a body, commencing at the Karnál Tahsíl and gradually working Southward. They then passed into the Panipat Tahsíl, and having worked through this they turned Westward towards the Kaithal Tahsíl. The vaccinators were employed, however, almost exclusively in the district, the large Municipal towns where there happened to be a dispensary, being left to the Hospital Assistants in charge, who were supposed to carry out as much vaccination as possible in the town.

The principal objections to this arrangement I thought were :—1st. That though one or more tahsils might have had vaccination thoroughly carried out in them, there would remain others in which the work could only be done to a very limited extent for want of time, the duration of the vaccination season being only 6 months. This proved to be the case under the above arrangements, and the Tahsíl of Kaithal scarcely benefited at all, while those of Karnál and Panipat received an undue share. This was the cause of some amount of ill-feeling among some of the people among whom vaccination is popular, though such beings are certainly extremely few in this district. 2nd. The vaccinators all being strange to the greater part of the country through which they were to work naturally would not have so much weight as they would had they been well known and popular among the people, and the work would naturally progress very much slower in consequence. 3rd. In the case of an epidemic of small-pox breaking out, and in the event of any complaints being made that the vaccinators had not been doing their work satisfactorily, that children who had been successfully vaccinated had contracted the disease, &c., I should in the majority of cases be totally unable to lay my hands on any particular vaccinator as being to blame, they having all worked through each district indiscriminately and without any regular system. Such was the case during the recent epidemic at Panipat. It is quite possible that some of the returns submitted were incorrect, but it was out of the question several months afterwards for me to discover the culprit. 4th. That a body of vaccinators all working together under the same conditions and in the same tahsíl at one and the same time would have the effect of producing an unwholesome spirit of competition. Each would try to stand first in the total number of operations performed. This feeling I think should be discouraged, the effect of it being, I am quite sure, to induce vaccinators to send in false returns. If they think that their chances of promotion, &c., depend on the actual amount of work they do, it would be quite out of question to even hope for a true return from men of their standing in life. 5th. That when a body of vaccinators is working together within a limited area, all holding different religious views and being of different castes, the natural tendency of the people is to object to some particular vaccinator's caste with a view to getting their children vaccinated by some other vaccinator who may happen to be a Brahmin or Muhammadan as the case may be. That there is a very strong feeling on this subject in some parts I am now more than ever convinced. If, therefore, all the vaccinators work together, some being Brahmins, some Muhammadans, other Kahars, &c., the work I am sure is hampered, and in many cases considerable dissatisfaction is caused. 6th. That the vaccination of large Municipal towns ought not to be left entirely in the hands of the Hospital Assistants in charge of dispensaries. It is impossible for them to carry out vaccination satisfactorily throughout a large town like Karnál or Panipat without neglecting their duties at the dispensary, though I think there is no objection to their affording help to the vaccinators when their duties at the dispensary will allow of it.

The system I have adopted during the present cold weather is as follows :—

I have endeavoured, as far as possible, to allot a certain tract of country in this district to each vaccinator or pair of vaccinators, making them individually responsible for the vaccination in that part. I originally decided to give each vaccinator one or two thanas a piece and thus make them work quite independently of each other. I found later on, however, that it was an immense advantage in some cases to have two vaccinators (if possible of the same caste) working hand in hand together, so I then divided them off in pairs, and gave each pair a certain number of thanas to work in, the only exception to this being in the case of vaccinators Uttam Chand and Nathu Singh, who have for the greater part of last cold weather been working independently of each other. Owing to the first two sets of lymph sent by the Deputy Sanitary Commissioner failing to produce good vesicles, there was some delay in starting the work which practically speaking, did not commence till the beginning of November. About this time I had had about 8 children successfully vaccinated in the Karnál city, and one child at the city of Panipat. From these arm to arm vaccination commenced in Karnál and Panipat. Vaccinators Ramji Das and Kanhya Lal having collected some quantity of lymph pressed between two small pieces of glass were sent off to the city of Kaithal (38 miles distant) to commence operations there. Vaccinators Badan Singh and Narain Singh did the same, commencing their operations in the Pundri Thana, 28 miles West of Karnál. With the exception of these two men, all the vaccinators, including the Native Supervisor, were employed at first in the three large Municipal towns of the district, viz. : Karnál, Panipat and Kaithal. Vaccination is very unpopular in all these towns, and the work progressed very slowly and with great difficulty.

In Karnál itself during the first month, I was in the habit of going down myself very often to the city and being present during the vaccine operations which were carried on every morning. Many of the members of the Municipal Committee also gave me valuable help by coming down themselves to the spot, and explaining to the ignorant people the advantages of vaccination, &c. At the end of November there were 1,372 children vaccinated in the district, as follows :—

Karnál city	207	} Almost exclusively by the vaccinators.
Panipat „	...	...	275
Kaithal „	...	...	257
Pundri Thana	...	...	551
Kunjpora town	82	By the Hospital Assistant in charge of dispensary.

The vaccination in the cities was done in a systematic manner, each mohalla being taken in turn, the vaccinators having first obtained the names, from the Registrar of Births, of every child born in it during the year.

The castes found most opposed to vaccination in the cities are—1st Bannias and Khatris, 2nd Brahmins, 3rd Rajputs. The most satisfactory work done was in parts of the city inhabited by the lowest castes, and in the Sadr bázár where the people are mostly *Chumars* and sweepers, vaccination was most thoroughly carried out.

The operations were done by puncture only, (never by scratching.) In a strong healthy child the custom was to apply three punctures on each arm, but in very young or delicate children the number of punctures was less. A very large number of children were not vaccinated after being examined on account of ill-health.

Some time about the first week in December, the three large cities having been completed as far as was possible, the vaccinators were ordered into the district where they at once commenced arm to arm vaccination in the various villages. This work, as compared with that of large towns, was a very easy task, the greatest opposition being met with among well-to-do Natives who do not exist in any numbers in the villages.

During the month of December there were 2,101 more children vaccinated in the district. I myself made a tour of inspection during this month, and at all the villages I visited I verified as far as possible the returns that had been submitted. I did not see a single unsuccessful case, nor did I see any cases of more than six punctures on the same child. On the whole, I have no reason for believing (judging from the cases I saw) that the returns had been incorrect, or that the percentage of successful cases was less than that stated in the returns. I never found all the children present in any village who were stated to have been vaccinated, but this was accounted for by the parents either having gone into some other village or into the fields to work with their children. During my tour, Khushal Singh (Native Supervisor) accompanied me, and he has since then inspected many other villages, and reports that he has not yet found a single unsuccessful case which was not returned as such.

Before starting into the district each vaccinator was supplied with a written authority signed by the Deputy Commissioner. This was drawn up by my clerk, Pandit Kishna Sahai, Triwary, and was written in plain Urdu, explaining in very clear language the object of the vaccinators, the advantages of vaccination, &c., &c. Each vaccinator has submitted to me every week a return shewing the names of villages at which he has been working, the number of operations performed, &c. This was drawn out by my clerk, Pandit Kishna Sahai, Triwary. A blank form of the return is enclosed for your information. Each vaccinator, should he wish it, is supplied with a *chapprasi* from the tahsil who accompanies him in his rounds from village to village, and gives him whatever help he may require.

The advantages of the present system, as compared with that of the previous year, when all the vaccinators were employed together, are as follows :—

1st.—That vaccination is carried out uniformly throughout the district, and no one part benefits more

than another. There is no fear of the vaccination season coming to a close without every village and town having had at least the opportunity of deriving the benefits of vaccination.

2nd.—I have endeavoured, as far as possible, so to distribute the vaccinators in the various thanas of the district, that each pair of them will be able to take a personal interest and pride in the tract of country over which he has had to work. In doing this, I have taken into consideration the work done by each vaccinator during the hot weather in the cause of sanitation, the tract of country over which he has worked, and have given each of them the same tract of country to carry out vaccine operations. In this way they will, I hope, in time become well known among the villages of their respective circles, because being intimate with their prevailing castes and peculiarities they will then know how best to work among them.

3rd.—In case of an epidemic of small-pox breaking out in any particular thana, the vaccinator in charge of that thana will be held in a way responsible, and it will be the duty of each vaccinator to minimise such outbreaks as do occur from time to time, by thorough vaccination carried out in his circle every cold weather. In the event of any such reports, as got about last year, *viz.*, the death of several children from small-pox who had been successfully vaccinated, the Civil Surgeon will at once be able to investigate the matter by referring to the returns of the vaccinator in charge of the thana where such an occurrence is said to have taken place.

4th.—That the feeling of competition among the vaccination staff, each wishing to show the largest number of vaccine operations entered against his name, which is the cause, I fear, of many false returns, will no longer exist. I have explained to my vaccinators that I shall think no better of a man simply because he has done the largest number of operations during a given period, but what I wish them to understand is that if I give preference to any it will be to him who has his thanas kept scrupulously clean, free from all ordinary insanitary conditions, and in which small-pox shows itself but seldom, and then not in the form of a widespread epidemic.

5th.—That in distributing the vaccinators over the district in pairs, I have endeavoured as far as possible to make their castes and religious views agree. Thus, in the Karnál Thana I have two Muhammadan vaccinators working together. In the Pundri Thana I have two Sikhs, &c. This will prevent one vaccinator, in order to surpass his neighbour, raising objections in the minds of the people against another vaccinator on the score of caste. A case of this kind has lately come to my notice, and I am convinced that it is an important consideration.

6th.—That the vaccination of large Municipal towns has not been left entirely in the hands of Hospital Assistants in charge of dispensaries, the work having been carried out almost exclusively by the vaccination staff, the Hospital Assistants having been allowed to assist only when their other duties would permit of their so doing. In conclusion I wish especially to bring to your notice, and for such action as you may think desirable, the names of several Native gentlemen of the district who have shown conspicuous zeal and interest in the cause of vaccination, and who have afforded me invaluable aid in carrying out the work :—

Nawab Shamsheer Ali Khan of Karnál ; at the commencement of the season this gentleman, at a time when vaccination in the City of Karnál showed signs of being a failure altogether on account of its unpopularity among the upper classes of natives, had his own child vaccinated as an example, the effect of which was that the prejudice in the minds of so many was at once removed ; and it is due to his invaluable aid in going down to the seat of operations almost every day with the vaccinators and talking to the people, that the success of the operations in the city are largely due. In the Karnál City also two members of the Municipal Committee are specially worthy of notice for the help they afforded me, *viz.*, Muhammad Husain and Piare Lal. At Kaithal this cold weather there were no less than 257 children vaccinated in little over one month. This was due almost entirely to the exertions of Kazi Ghulam Nabbi, Member and Secretary to the Municipal Committee, in the cause of vaccination, and I think he is especially deserving of notice.

There are several others to whom I am indebted, but who are in a lower sphere of life than the above, *viz.*, Mana Singh, Ranger, and Pandit Maharaj Kishen, Registrar of Births and Deaths, Karnál."

HISSAR.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	2
Third „ „	...	...	...	...	...	2

Work performed during the year.

Population	...	...	...	...	...	504,183
Average population per square mile	...	...	...	...	...	137
Total vaccinations	...	...	...	...	...	10,451
Successful cases	...	...	...	...	...	10,098
Percentage of successful cases	...	...	...	...	...	96.62
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	20.03
Average number vaccinated by each vaccinator	...	...	...	...	...	2,090.20
					Rs. A. P.	
Cost of each successful case	...	...	...	...	...	0 2 6

The Civil Surgeon of this district, Dr. Cooper, has not furnished any report regarding the vaccinations performed by the establishments employed under him.

The towns of Fatahabad, Bhiwani, Hissar, Barwála and Hansi, however, appear to have been overhauled during the year under review by the district vaccinators, who are reported to have worked satisfactorily.

ROHTAK.

Vaccination Establishment.

First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	4

Work performed during the year.

Population	...	...	...	...	...	...	553,609
Average population per square mile	...	...	...	...	...	...	295
Total vaccinations	...	...	...	...	...	...	15,404
Successful cases	...	...	...	...	...	...	15,034
Percentage of successful cases	...	...	...	...	...	...	97.66
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	27.16
Average number vaccinated by each vaccinator	...	...	...	...	...	...	2,200.57
							Rs. A. P.
Cost of each successful case	...	...	...	...	...	...	0 1 2

The Civil Surgeon, Dr. Baron, visited no less than 13 towns and 375 villages of his district, but he has not given any account of the number or quality of the vaccinations inspected by him. He observes “that, considering the great opposition everywhere met with in this district, vaccination has been carried on with fair results. The Banniah class,” in his opinion, “will not accept the measure at all. Two of this class, wealthy men of Beri, both of whom have been lately made Honorary Magistrates, simply refused to countenance vaccination even by attending a meeting of the headmen of the town assembled to discuss the matter.” The conduct of these Magistrates has already met with the displeasure of the Deputy Commissioner. Dr. Baron says that “in most of the towns and large villages the assistance I have received from headmen, has been so meagre as hardly to be called assistance, but in the outlying villages I have generally met with cheerful help.”

“I quite agree with the Deputy Commissioner of Rohtak, Mr. Steel, in thinking that Dr. Baron has exercised very clear supervision, and that he deserves great thanks for the extremely careful and judicious manner in which he has carried out the operations of the year”; but I hope Dr. Baron will in future be very particular to give a clear statement of the result of his inspection of the vaccination work performed by his staff.

SIRSA.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
Second Class Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	3

Work performed during the year.

Population	...	...	...	...	...	...	253,275
Average population per square mile	...	...	...	...	...	...	68
Total vaccinations	...	...	...	...	...	...	8,637
Successful cases	...	...	...	...	...	...	8,355
Percentage of successful cases	...	...	...	...	...	...	96.79
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	32.99
Average number vaccinated by each vaccinator	...	...	...	...	...	...	1,439.50
							Rs. A. P.
Cost of each successful case	...	...	...	...	...	...	0 2 12

Two of the vaccinators in this district were dismissed and their places duly filled up—the one for making false entries, and the other for absenting himself without leave. The Civil Surgeon Mr. Crossley, had every reason to be well satisfied with the work done by his staff. He states in his report that he inspected the operations in 83 villages and 5 Municipal towns of his district, and did not find a single false entry. In the quality of the work too he has been well satisfied; with very few exceptions indeed, the number of well-formed vesicles on each child's arm were 6, that is, 3 on each.

The vigour of the lymph was maintained right through by the introduction of regular monthly supplies of 12 tubes at a time, which I obtained direct from the Association for the supply of pure lymph established in London through Ferris & Co., Chemists of Bristol. The advantage of this was not only a healthy flow of fresh lymph, but the means of extension of the first operations prevented the necessity of taking children from village to village either for purpose of vaccination or obtaining lymph. “Another evil obviated,” says the Civil Surgeon, “was, that as a much larger number of children vaccinifers were obtainable to select from, there was no necessity to take the lower caste ones.” Both these diffi-

culties, the Civil Surgeon rightly observes, are very much greater than is generally supposed. The higher caste not only object to have their children vaccinated from the arms of the children of inferior castes, but will not consent to the lymph being taken from their children's arms, so that the more the number of vaccinifers is multiplied the better.

UMBALLA.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	4
Third „ „	...	...	...	...	...	...	8

Work performed during the year.

Population	...	...	...	...	...	...	1,067,263
Average population per square mile	...	...	...	...	...	...	394
Total vaccinations	...	...	...	...	...	...	19,652
Successful cases	...	...	...	...	...	...	17,878
Percentage of successful cases	...	...	...	...	...	...	92.16
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	16.87
Average number vaccinated by each vaccinator	...	...	...	...	...	...	1,511.69
						Rs. A. P.	
Cost of each successful case	...	...	...	...	...	...	0 2 2

During the year under review vaccinators were distributed in the district as follows :—

Two vaccinators were sent to Rúpar Tahsíl, three to Jagádhri, six to Píplí, and two kept in the Umballa Tahsíl.

In October 1882, lymph was first started in Umballa city, and afterwards spread in the district.

The six vaccinators who were sent to Píplí Tahsíl finished the whole tahsíl by the end of February, and then were sent to help the vaccinators in the Umballa and Jagádhri Tahsís. These latter tahsís were finished by the end of March 1883. The Rúpar Tahsíl, where two vaccinators continued to work and subsequently were helped by another vaccinator, was also wholly vaccinated by the end of March. During this season four tahsís were entirely vaccinated and two tahsís (Naráingarh and Kharar) left unvaccinated, these will be taken over next vaccinating season. The Civil Surgeon saw a deal of the vaccination quite recently done, it looked good; but, in examining very little children in schools, Dr. Bateson remarks that “it seemed to me that either a very great number of them had never been vaccinated at all, or that the marks of vaccination had very soon disappeared.” In Rúpar the Civil Surgeon saw some little children regarding whom it was positively asserted that they had been vaccinated last year; but it was rare to find marks of vaccination on their arms. During his tour, the Civil Surgeon saw some vaccination work which had been done perhaps some three or four weeks back, yet the marks seen were not the finest; depressed good lymph mark one expects to see, but little round shining scale—like scars which perhaps are those which are so evanescent. Dr. Bateson regrets that, being in charge of a large jail, he could not find sufficient time to inspect as much of the vaccination work as he wished.

The Civil Surgeon's order, to the Native Supervisor, *viz.*, that he should choose times for vaccination when house work is not usually being done by villagers' wives, and that when the children are collected, he should keep them waiting as little time as possible, was a very judicious one.

LUDHIANA.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	5

Work performed during the year.

Population	...	...	...	...	...	...	618,835
Average population per square mile	...	...	...	...	...	...	429
Total vaccinations	...	...	...	...	...	...	18,126
Successful cases	...	...	...	...	...	...	17,990
Percentage of successful cases	...	...	...	...	...	...	99.33
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	29.08
Average number vaccinated by each vaccinator	...	...	...	...	...	...	2,265.75
						Rs. A. P.	
Cost of each successful case	...	...	...	...	...	...	0 1 2

No details are furnished by the Civil Surgeon as to the manner in which the vaccine staff of his district worked during the year under review. Brigade Surgeon R. Rouse was, no doubt, very active in inspecting the vaccine operations of no less than 224 Municipal towns and villages; but it is a matter of regret that he does not say a word as to the *result* of his inspection; he simply gives a long list of the names of the villages visited by him.

SIMLA.

There is only one vaccinator attached to this district, who was chiefly employed in the Simla Sanitarium and certain villages in the interior of the district. The total number of vaccinations performed by him during the year were 912, of which 759 were successful.

The work in this district is now carried on by the Special Vaccination Staff under the supervision of Dr. O'Neill, Deputy Sanitary Commissioner, Eastern Circle.

During the year a proposal was made to render vaccination compulsory in the Simla Sanitarium, but it was eventually negated by the Municipal Committee.

JULLUNDUR.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinators	...	...	...	...	...	...	2
Second „	„	...	...	...	...	...	3
Third „	„	...	...	...	...	...	7

Work performed during the year.

Population	...	...	...	...	...	...	789,555
Average population per square mile	...	...	...	...	...	...	596
Total vaccinations	...	...	...	...	...	...	22,962
Successful cases	...	...	...	...	...	...	21,543
Percentage of successful cases	...	...	...	...	...	...	93.88
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	27.29
Average number vaccinated by each vaccinator	...	...	...	...	...	...	1,913.50
						Rs. A. P.	
Cost of each successful case	...	...	...	...	...	0 1 9	

The Civil Surgeon Dr. Penny, states in his report, that vaccine operations were commenced in this district, on the 11th October 1882, and ended on the 25th March 1883. During the vaccinating season, the vaccinators visited 1,130 villages. The Civil Surgeon appends a small sketch map to show the four tahsils of the Jullundur District by lines and arrows to indicate how the work was carried on, how the direction was from the Jullundur to Nokodar Tahsil along either bank of the West Bayne skirting Kapúthala, to the corner formed by the junction of the Beas and Sutlej rivers, and thence from Shah Kote to the town of Nokodar through all the villages on either side of the road from Nokodar to Nurmahal, which is in the Phillour Tahsil. Crossing the Railway at Phillour, the party swept through the villages on the right bank of the Sutlej to Rahon, and thus got into the Nawashahr Tahsil. The establishment was superintended by the Native Supervisor, and also by the Civil Surgeon, as often as he was able to move into camp; but Dr. Penny gives no details of the result of his inspection beyond a mere statement, viz., that the quality of vaccination has been excellently good, and excepting in very delicate children or some special reason, the operation has been performed on each arm by punctures, three well formed pustules on each arm being the result.

HOSHIARPUR.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	3
Third „	„	...	...	...	...	...	8

Work performed during the year.

Population	...	...	...	...	...	...	901,381
Average population per square mile	...	...	...	...	...	...	450
Total vaccinations	...	...	...	...	...	...	24,215
Successful cases	...	...	...	...	...	...	23,346
Percentage of successful cases	...	...	...	...	...	...	96.51
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	25.91
Average number vaccinated by each vaccinator	...	...	...	...	...	...	1,862.69
						Rs. A. P.	
Cost of each successful case	...	...	...	...	...	0 1 5	

No report received, but from the statement of work performed by the district vaccinators it appears that 4 tahsils, viz: Hoshiarpur, Garshankar, Una and Dasuya and 1,901 villages were overhauled during the season. The vaccinators working through each tahsil by Zails. The Deputy Commissioner Mr. C. Roe, is of opinion that "vaccination in this district is getting more and more popular."

KANGRA.

Vaccination Establishment.

First Class Vaccinator	...	...	...	...	...	1
Second „	„	...	...	...	...	1
Third „	Vaccinators...	...	...	...	...	2

Work performed during the year.

Population	...	...	...	...	...	730,845
Average population per square mile	...	...	...	...	...	87
Total vaccinations	...	...	...	...	...	5,039
Successful cases	...	...	...	...	...	4,907
Percentage of successful cases	...	...	...	...	...	97.38
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	6.71
Average number vaccinated by each vaccinator	...	...	...	...	...	1,259.75
					Rs. A. P.	
Cost of each successful case	...	...	...	...	0	3 2

No report furnished by the Civil Surgeon. The vaccination staff was employed during the whole year in vaccinating during the cold weather in the lower lying parts, and during the hot weather in Kulu and the higher parts.

AMRITSAR.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	1
First Class Vaccinators	...	...	...	...	...	2
Second „	„	...	...	...	...	3
Third „	„	...	...	...	...	8

Work performed during the year.

Population	...	...	...	...	...	893,266
Average population per square mile	...	...	...	...	...	535
Total vaccinations	...	...	...	...	...	17,902
Successful cases	...	...	...	...	...	16,845
Percentage of successful cases	...	...	...	...	...	95.81
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	19.08
Average number vaccinated by each vaccinator	...	...	...	...	...	1,377.07
					Rs. A. P.	
Cost of each successful case	...	...	...	...	0	2 3

While vaccine operations are going on, the whole of the establishment, work together. Work is generally commenced in one tahsil and this is finished thana by thana before proceeding to the next tahsil. The thanas are vaccinated by Zails. In this way the whole establishment work together and their work is easily inspected which is a matter of the greatest importance.

As a rule, the people of the Amritsar District are not averse to vaccination.

The work in the Municipal town of Majitha was well done principally through the most efficient help given by one of the members of Committee Sardar Basawa Singh. The other members I am sorry to say gave no help nor did they take the slightest interest in the work.

During the year 1882-83 the Civil Surgeon Dr. Thompson inspected 3,385 cases of primary vaccination, of these 20 only were unsuccessful giving a percentage of 99.41 successful cases inspected. He also saw 5 re-vaccinations, of which 3 were successful and 2 unsuccessful giving a percentage of 60.00 successful.

GURDASPUR.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	1
Second „	Vaccinators	...	...	...	...	3
Third „	„	...	...	...	...	7

Work performed during the year.

Population	...	...	...	...	...	823,695
Average population per square mile	...	...	...	...	...	496
Total vaccinations	...	...	...	...	...	24,386
Successful cases	...	...	...	...	...	21,936
Percentage of successful cases	...	...	...	...	...	89.96
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	26.63
Average number vaccinated by each vaccinator	...	...	...	...	...	2,216.90
					Rs. A. P.	
Cost of each successful case	...	...	...	...	0	1 4

Vaccination seems to have been thoroughly carried out during the year. "The new arrangements," says the Civil Surgeon, "have worked well." In only a few instances has any opposition been met with. Dr. Henderson made it a rule to examine all the children met in the towns and villages inspected by him, and he states that it was rare to meet one without marks of vaccination. The people in this district are in favor of vaccination, but they object to their children being dragged about from village to village for the supply of lymph. To remedy this grievance, Dr. Henderson offers the following suggestion: "The only remedy I can see is to reserve a few large villages near head-quarters to supply lymph in tubes every few days to the vaccinators. I found this plan worked well in Shahpur in 1862 and 1863. A single vaccinator provided with tubes of fresh lymph filled by myself went in advance and was satisfied if he got one or two vaccinated in each village or group of villages. His route was given to him and a diagram map, so that I knew each day when he was at certain villages. A supply of fresh tubes was waiting him; he was followed after seven days by another vaccinator, and so on, those following the first man vaccinating from arm to arm. In this way each village was visited at intervals of a week five or six times. Whenever any marked opposition was offered, the village was entirely passed over, and when the next outbreak of small-pox occurred, the villagers themselves were able to see the wonderful protecting power of vaccination. To get over a large district in one season, it would of course be necessary to have two or more sets of vaccinators working along different lines; the chief point in my proposal is that lymph should be supplied in tubes fresh and fresh every few days to the men who go in advance, so as to avoid the necessity of carrying out children from village to village." As both the Commissioner and the Deputy Commissioner approve of the Civil Surgeon's suggestion, I have no objection to his conducting the operations next vaccinating season on this plan.

SIALKOT.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinators	...	...	...	...	...	...	2
Second " "	...	...	...	...	...	...	3
Third " "	...	...	...	...	...	...	9

Work performed during the year.

Population	...	...	...	...	...	...	1,012,148
Average population per square mile	...	...	...	...	...	...	510
Total vaccination	...	...	...	...	...	...	36,528
Successful cases	...	...	...	...	...	...	36,049
Percentage of successful cases	...	...	...	...	...	...	98.76
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	35.60
Average number vaccinated by each vaccinator	...	...	...	...	...	...	2,609.14
Cost of each successful case	...	...	...	...	...	Rs. A. P.	0 1 2

No report received from this district. The Civil Surgeon of this district is in joint Medical charge of the civil and military stations, and hence it was not possible for him to move into camp. The outturn of the work is satisfactory, but the Civil Surgeon does not mention in his report whether any inspection of the operations has been made by his Assistant Surgeon. The Tahsils of Siálkot, Daska, Pasrúr, Rega, Zafarwál, a portion of the Jammu territory and 2,223 villages were overhauled during the year. The work commenced on 3rd October 1882 and ended on 19th March 1883.

LAHORE.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinators	...	...	...	...	...	...	2
Second " "	...	...	...	...	...	...	3
Third " "	...	...	...	...	...	...	6

Work performed during the year.

Population	...	...	...	...	...	...	924,106
Average population per square mile	...	...	...	...	...	...	218
Total vaccinations	...	...	...	...	...	...	22,704
Successful cases	...	...	...	...	...	...	21,670
Percentage of successful cases	...	...	...	...	...	...	95.60
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	23.45
Average number vaccinated by each vaccinator	...	...	...	...	...	...	2,064.00
Cost of each successful case	...	...	...	...	...	Rs. A. P.	0 1 8

The Civil Surgeon, Dr. Gray, states in his report, "that vaccination has been very satisfactorily carried out in the district." It was supervised in the beginning of the year by Assistant Surgeon Gokal Chand, and from November to December by Assistant Surgeon Ram Kishen. Both are stated to have

performed their duties efficiently. Dr. Gray can speak from personal knowledge only of Assistant Surgeon Ram Kishen, whom he considers to be deserving of commendation for the zeal and judgment he has displayed in the performance of his duties. In addition to testing the vaccinator's work, he, the Assistant Surgeon has furnished written sanitary reports on a few Municipal towns and 28 villages; also a report on the vaccine operations performed during the year, in which it is stated that vaccination is getting more popular in the district, and that a larger number of vaccinations were done in the year under review as compared with the previous year.

The following gentlemen are reported by Ram Kishen to have taken interest in vaccinations :—

In *Kasur*, Hafiz Habibulla and Hafiz Abdulla Khan, Municipal Commissioners.

In *Patti*, Khalil Beg and Mirza Mubarik Ali, Municipal Commissioners.

In *Khudian*, Matab Roy, Municipal Commissioner.

In *Chunian*, Ram Chand, Patwari, and Bava Hardit Singh.

The following zaildars personally accompanied the vaccinators on their visits to their respective villages :—

Sardar Gurmukh Singh of Bhasian, Sardar Sundar Singh of Munhala, Chaudhri Miran Bakhsh of Niazbeg, Malik Alyas of Sharakpur.

With very few exceptions, the lambardars are reported to have rendered useful assistance to the vaccinators.

The Assistant Surgeon acknowledges the valuable help rendered him in the vaccination work by Tahsildars Jaggan Nath of Kasur and Muhammad Ashraf Ali of Chunián.

In the city the work has been supervised by Assistant Surgeon Brij Lal Ghose, Rai Bahadur, and the Civil Surgeon. The work was distributed to the different sections of the city presided over by an Honorary Magistrate with a Municipal member, a Mohalladar, and a number of *choudhris*. Amongst these gentlemen, aid worth mentioning is reported to have been given by Nawab Abdul Majid Khan, Rai Das Mal, and Bhai Mian Singh.

A severe epidemic visited the city during the year, the mortality was generally amongst infants under one year of age. "That this epidemic," says Brij Lal Ghose in his report, "should occur in a city where vaccination is carried on year after year, is owing to the extreme carelessness and obstinacy on the part of the parents (Hindus). Their greatest objection seems to be to taking lymph from the children which must be done in order to keep the vaccination going on."

Dr. Gray regrets to say that so far as vaccination is concerned, the capital of the province is a very long way behind the rest of the districts. There have been frequent complaints by the vaccinators who work in the city of the opposition of the people, more especially of the Hindus, and of the difficulties they (the vaccinators) have to encounter, and the city has a bad influence on the district; for so long as the district vaccinators were in the neighbourhood of Lahore, the work did not go on quite smoothly: it was not till they got beyond the influence of Lahore that opposition and difficulties vanished. In drawing attention to the remarks of Assistant Surgeon Brij Lal Ghose, Rai Bahadur, as quoted above, on the subject of vaccination in the city, Dr. Gray "feels sure it is owing to no want either of zeal or discretion on the part of Brij Lal Ghose for whom Dr. Gray has a high opinion as an honest, hard-working, intelligent and judicious officer."

The ignorant Hindu females in the city, as a class, are highly prejudiced against vaccination. They conceal their children or make some idle excuse when the vaccinators visit the mohallas. To overcome this difficulty the Assistant Surgeon proposes the employment of Hindu female vaccinators. I believe the proposal is worth an experiment, and I shall take an early opportunity to refer it to the Municipal Committee for consideration.

"One hopeful feature in regard to vaccination in and near the city," says Dr. Gray, however, "is that the number is on the increase of those who quite spontaneously bring their children to the Mayo Hospital to be vaccinated."

GUJRANWALA.

Vaccination Establishment.

Native Supervisor	..	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	3

Work performed during the year.

Population	...	...	...	...	...	...	616,892
Average population per square mile	...	...	...	...	...	...	207
Total vaccinations	...	...	...	...	...	...	20,645
Successful cases	...	...	...	...	...	...	19,562
Percentage of successful cases	...	...	...	...	...	...	94.85
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	31.71
Average number vaccinated by each vaccinator	...	...	...	...	...	...	2,580.62
						Rs. A. P.	
Cost of each successful case	...	...	...	...	...	0 1 3	

Operations were begun at the end of the 2nd week in October at the Sadr Station. The first few children were vaccinated by the Civil Surgeon, in order to test the quality of the first supply of lymph. The result having proved satisfactory, the work was at once extended by arm to arm operations, and by the end of the month the entire area East of the Sadr Tahsíl was well in hand. The work was pushed on steadily and successfully during the remaining two months of the year. At the end of the year 1882, not only was the whole tahsíl completed, but the work had progressed fairly into the adjoining tahsils of Wazirabad and Hafizabad.

It has always been a very pleasing duty during the past five or six years says the Civil Surgeon "to report the great popularity of vaccination in this district." It was, therefore, with very great surprise and regret that Dr. Quinnell had to represent a very unaccountable and strange apathy displayed for the first time in several towns this year; but which was most marked in Hafizabad, Killa Didár Singh, and in the Sadr town itself. The great interest always shown in this work, as well as the willing help hitherto afforded the vaccinators on the part of the native officials, members of the Municipal Committee, and other influential residents of these towns, was almost wholly wanting. Delays and difficulties ensued; the vaccinators were discouraged, and the work for a time retarded. So much so indeed, that for example, both Killa Didár Singh and Hafizabad had to be revisited thrée times by the vaccinators before the help required was given, and the remaining children to be vaccinated were got together, in order to allow of the work being completed. Ordinarily had the usual assistance been given, the work would have been done in one or at the outside two days. Dr. Quinnell does not give any reason as to why such an undesirable change took place in the attitude of the towns alluded to above towards vaccination.

In remarkable contrast with the above, Dr. Quinnell reports the active and praiseworthy interest exhibited by Tahsildár Pars Ram of Wazirabad, Lala Harnarain, Member of Municipal Committee, Sadhaura; Hakim Singh, Zaildar of Nurpur Chabil; Sardar Anoke Singh, Zaildar, Churkana. The Civil Surgeon recommends these gentlemen for some special mark of favor. The efforts of the following gentlemen also in promoting vaccination were very praiseworthy, viz :—Sardar Lehna Singh and Maulvi Muhammad Mahbub Alim, Member Municipal Committee, Gujranwála; Wazir Bakhsh and Bhan Shahs, Members, Municipal Committee, Rám Nagar; and Ghulam Haidar, Zaildar, Bhupra.

Dr. Quinnell is happy in being able to report that the appreciation of the protective powers of vaccination against small-pox on the part of the inhabitants of Rám Nagar has always been quite enthusiastic. For, he states that "when the season comes round, and notice is given and the day fixed for vaccination, the women assemble with their children at the appointed time and place of their own accord, and it is surprising to see the crowding and shouldering to get near the vaccinators, each eager to have her child done first. The explanation of this, it is believed, is due to the fact that there has been no small-pox (certainly no deaths from it) for four or five years in Rám Nagar, and where in years before, it was a regular and dreaded scourge especially amongst children." Surely a more satisfactory proof of faith in the benefits of vaccination could scarcely be desired, and the only regret is that the same feeling of confidence is not universal. The manner in which vaccination work has been conducted in this district is highly commendable to the Civil Surgeon Dr. Quinnell, who has spared no labor and trouble in supervising personally the operations performed during the year.

FEROZEPORE.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	5

Work performed during the year.

Population	...	...	...	...	...	...	650,519
Average population per square mile	...	...	...	...	...	...	204
Total vaccinations	...	...	...	...	...	...	24,646
Successful cases	...	...	...	...	...	...	24,473
Percentage of successful cases	...	...	...	...	...	...	99.29
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	37.62
Average number vaccinated by each vaccinator	...	...	...	...	...	...	3,080.75
Rs. A. P.							
Cost of each successful case	...	...	...	...	...	...	0 1 3

The report of the Civil Surgeon of this district is very meagre. It does not give any details of the inspection of vaccine operations by him, or by his Assistant Surgeon, or the Native Supervisor.

RAWALPINDI.

Vaccination Establishment.

Native Supervisor	...	...	...	...	1
First Class Vaccinator	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	3
Third „ „	...	...	...	...	6

Work performed during the year.

Population	...	...	...	820,512
Average population per square mile	...	...	...	114
Total vaccinations	...	...	...	15,496
Successful cases	...	...	...	14,706
Percentage of successful cases	...	...	...	97·06
Persons successfully vaccinated per 1,000 of population	...	...	...	18·11
Average number vaccinated by each vaccinator	...	...	...	1,549·60
				Rs. A. P.
Cost of each successful case	...	...	...	0 2 1

Surgeon-Major G. Massy reports that the vaccinators commenced work under the new system in October 1881; a staff of 10 vaccinators and one Native Supervisor then commenced operations in the Kahúta Tahsíl. The system followed was the division of the Tahsíl into five circles, each circle being made over to two vaccinators. The Kahúta Tahsíl being finished, a fresh Tahsíl was entered, and in this way the whole district was gone over. On the vaccinators commencing work in a tahsíl, the Tahsildár apportions a certain number of villages to each pair of vaccinators, and as the staff for this district consists of 10 vaccinators, each tahsíl was accordingly divided into five circles. The division of a tahsíl into circles has been invariably left to the discretion of the Tahsildár. The tahsíl visited by the vaccinators in 1881-82, were Kahúta, Rawalpindi, Gujar Khán, Pindigheb, Attock, Fatahjang and a portion of the Murree Tahsíl; since vaccination commenced under the new system in October 1881, every town and village in the district has been twice gone over, and the villages in the Rawalpindi Tahsíl are now being gone over for a third time.

During the year under report, Dr. Massy obtained a supply of cow's lymph from Bombay, which was kept up in the low hills about "Karur," during the hot weather, and from thence it was taken down through the Kahúta Tahsíl, at the beginning of the cold season. Dr. Massy was assisted in finishing this tahsíl by Dr. Doyle, the Deputy Sanitary Commissioner, who sent some of his staff to work with Dr. Massy's vaccinators.

Very little difficulty was experienced in carrying on vaccination throughout the district, except amongst the people inhabiting the Chhuchh plains, which is a portion of the Attock Tahsíl adjoining the Hazára District. The people here were always more or less opposed to vaccination, and in former years invariably gave a good deal of trouble to the Provincial Staff. The inoculators from the Kobát and Hazára Districts used to visit this portion of the tahsíl periodically, and consequently it was hardly ever free from small-pox. It is reported, however, that for two years the inoculators have not visited Chhuchh, and it is believed their influence has somewhat died out.

The vaccine operations of some 70 villages in several portions of the district were inspected by the Deputy Medical Officer of the district. Of the 1,183 primary vaccinations indiscriminately picked out by him, 99·4 per cent. were successful. Dr. Massy himself inspected the vaccinations which were done at Kahúta, Karur, Hassan Abdal and Rawalpindi, and invariably found the quality of the work excellent. He regrets, however, he has not been able to go about the district as much as he wished, owing to the nature of his duties at the Sadr Station. It is however his intention to inspect as much of the vaccinators' work as possible during the next cold weather, personally, and when unable to go himself, to depute the Deputy Medical Officer for this duty.

The manner in which Dr. Massy supervised his vaccine establishment during the year is satisfactory.

JHELUM.*Vaccination Establishment.*

Native Supervisor	...	...	...	1
First Class Vaccinator	...	...	...	1
Second „ Vaccinators	...	...	...	2
Third „ „	...	...	...	5

Work performed during the year.

Population	...	...	...	589,373
Average population per square mile	...	...	...	128
Total vaccinations	...	...	...	9,178
Successful cases	...	...	...	8,441
Percentage of successful cases	...	...	...	92·11
Persons successfully vaccinated per 1,000 of population	...	...	...	14·33
Average number vaccinated by each vaccinator	...	...	...	1,147·25
				Rs. A. P.
Cost of each successful case	...	...	...	0 3 1

Vaccine operations were carried on in the Tahsíl of Jhelum, Pind Dádan Khán, Chakwál, and Talagang. Throughout the entire vaccine season, one vaccinator confined his work to the cantonments, the town of Jhelum, and to the villages in the immediate vicinity. During his tour along the outskirts of the district, the Civil Surgeon inspected some of the work of the year under report and of previous

years. Fully one thousand children and youths were inspected, and judging from the character of the cicatrices, a favorable opinion cannot be pronounced. Very many presented pugmentation where large and well marked cicatrices should have been, and many whom the parents and relatives stated to have been successfully vaccinated did not exhibit even such discoloration. So far as could be perceived during his tour, the Civil Surgeon says, there is no antipathy whatever to vaccination on the part of the inhabitants. To remedy as far as possible the hitherto bad and indifferent vaccine works, peremptory orders have been issued by the Civil Surgeon to the Native Supervisor to re-vaccinate all, no matter the age or sex, who did not exhibit well marked cicatrices, to vaccinate by scratching rather than by puncture, to apply lymph to the surface prior to abraiding it, to wash the lancet after each operation, and lastly to take lymph from only young and thoroughly healthy children. Dr. McDonald states that the operations of the year under report would have been far more numerous had not fever of a virulent type pervaded the greater portion of the district during the latter months of the year 1882.

GUJRAT.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	7

Work performed during the year

Population	...	...	...	...	...	...	689,115
Average population per square mile	...	...	...	...	...	...	324
Total vaccinations	...	...	...	...	...	...	24,752
Successful cases	...	...	...	...	...	...	22,771
Percentage of successful cases	...	...	...	...	...	...	92.18
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	133.06
Average number vaccinated by each vaccinator	...	...	...	...	...	...	2,475.20
Rs. A. P.							
Cost of each successful case	...	...	...	...	...	...	0 1 4

At the beginning, the whole staff was concentrated in one tahsíl, each man having one zail to protect, and each man being responsible for his own work. After the completion of work in their zails the vaccinators were moved on to zails in other tahsíls. The supervisor was constantly employed at his special function. The Civil Surgeon states that during the first half of the year lymph was conveyed on glasses from village to village to meet the wishes of the Deputy Commissioner in the interests of the people. But arm to arm operations were conducted within each village community. In the second half of the year, the Deputy Commissioner consented to return to the method of propagating lymph from arm to arm and from village to village. One vaccinated child is now taken to the nearest unprotected village, and the Civil Surgeon is glad to report the work is progressing favorably. There are occasional complaints against this system, and lymph has had to be introduced a second time into a village. In a few instances an unprotected child has been taken to a protected village to be vaccinated and to return to its own village to extend the benefit at home. In smoothing over these difficulties, the Native Supervisor, Basant Ram, is reported to have shown himself a man of tact and good judgment. In only two instances was it necessary for the Civil Surgeon to go in person to remove obstruction.

Dr. Deane inspected the work of each vaccinator in each tahsíl, but it is much to be regretted that he has not given any details as to the quality of vaccine operations inspected by him.

SHAHPUR.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	7

Work performed during the year.

Population	...	...	...	...	...	...	421,508
Average population per square mile	...	...	...	...	...	...	78
Total vaccinations	...	...	...	...	...	...	11,264
Successful cases	...	...	...	...	...	...	10,899
Percentage of successful cases	...	...	...	...	...	...	96.86
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	25.85
Average number vaccinated by each vaccinator	...	...	...	...	...	...	1,408.00
Rs. A. P.							
Cost of each successful case	...	...	...	...	...	...	0 2 7

Vaccination was carried out in every village of the three tahsils of the district, viz., Shahpur, Bhera and Khusháb. The district vaccine establishment has worked two by two to every pair of vaccinators, a certain area in the tahsil was given, and when the whole district was finished, individual vaccinators were located in the large towns and vaccinated any children who had been passed over in the first visit, &c., and also those who were born subsequently to it. These vaccinators also itinerated amongst the surrounding villages.

The Civil Surgeon, Dr. Nicholson, does not state as to whether he himself inspected any number of vaccine operations performed by his establishment.

MOOLTAN.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	4

Work performed during the year.

Population	...	...	...	...	...	...	551,964
Average population per square mile	...	...	...	...	...	...	80
Total vaccinations	...	...	...	...	...	...	18,172
Successful cases	...	...	...	...	...	...	17,513
Percentage of successful cases	...	...	...	...	...	...	97.43
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	31.78
Average number vaccinated by each vaccinator	...	...	...	...	...	...	2,581.71
							Rs. A. P.
Cost of each successful case	...	...	...	...	...	...	0 1 7

Early in October 1882, vaccine work was commenced by a staff of five vaccinators and one Native Supervisor in the Lodhrán Tahsil, two vaccinators working at the same time in the City of Mooltan and its suburbs. After completing operations in the Lodhrán Tahsil, two zails in the Shujabad Tahsil which had been left unvaccinated the previous season, were overtaken by the end of December 1882. Work having been commenced in the early part of January 1883, in the Tahsil of Serai Sidhu, was brought to a close there on the 10th of March 1883, when the Tahsil of Mooltan was entered upon. The total number of villages in which vaccination was performed was as follows: Mailsi Tahsil 344, Shujabad 98, Mooltan 166, Lodhrán 203, Serai Sidhu 252.

JHANG.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	3

Work performed during the year.

Population	...	...	...	...	...	...	395,296
Average population per square mile	...	...	...	...	...	...	61
Total vaccinations	...	...	...	...	...	...	12,144
Successful cases	...	...	...	...	...	...	11,648
Percentage of successful cases	...	...	...	...	...	...	96.75
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	29.55
Average number vaccinated by each vaccinator	...	...	...	...	...	...	1,349.33
							Rs. A. P.
Cost of each successful case	...	...	...	...	...	...	0 1 9

The Civil Surgeon, Chetan Shah, Rai Bahadur, states in his vaccine report, that for purposes of vaccination, the district was first divided into 12 divisions, six of which were made over to the six dispensaries and six to the six vaccinators; but subsequently all the six vaccinators were made to take up each tahsil at a time dividing themselves into two parties and vaccinating in all those villages that were beyond five miles from the head-quarters of the different dispensaries.

The same principle of extending the benefits of vaccination through the persuading agency of selected people, continued to guide the proceedings of the Civil Surgeon in regard to making vaccination popular this year as in the previous ones. Lectures on vaccination continued to be delivered by the Civil Surgeon and dispensary officers. The vaccinating staff was made to understand that enlightening the people on all points connected with vaccination was a more important duty than that of performing the operations, and that their respective services would be valued more for creating a desire for vaccination amongst the people than for the number of operations performed.

The respectable people of various positions in life and of the different religious denominations whose sympathies had already been enlisted in the cause of benefitting the people by the spread of vaccination, continued to help as before, and they were encouraged from time to time by commendatory *parwanas* reminding them that they were doing useful work for the good of their own people. The assistance of the civil authorities was asked to order the Tahsildárs, Lambardárs and Patwáris to convene meetings of the residents in each village and to join the vaccinators in their efforts to explain to the people the various points connected with vaccination.

Besides the five vaccinators and one supervisor who worked in the interior of the district, vaccination was, as already stated, also carried on by the dispensary officers, and their subordinates in towns at the head-quarters of the dispensaries, and in the villages within five miles of them. The officers and subordinates of the dispensaries being looked upon by the people as the ordinary physicians and Surgeons, vaccination conducted through them was very popular. Of these dispensary officers Assistant Surgeon Jai Singh is reported to have rendered the Civil Surgeon very great assistance.

The result of the continued efforts made in the cause of vaccination, says the Civil Surgeon has been:—1st. That a larger number of people than in the previous year has been acquainted with the history, &c. of vaccination, and especially with the differences between a successful and an unsuccessful operation. 2nd. That inoculation was nowhere* heard of in the district. Many people have learnt the great difference between “Naya-tika” vaccination and “Purana-tika” vaccination. 3rd. That a few more people than last year have included vaccination amongst their obligatory house hold institutions. 4th. That vaccination has become still more popular than last year in all the towns and large villages.

Chiniot, which was somewhat backward in this respect, has much improved through the exertions of the new Assistant Surgeon Jai Singh.

A few of the Hindus in some villages have not yet quite got over their prejudice against vaccination, but they live in places where no Medical Officer of influence has spent a few hours of his time. Such villages are, however, very few.

The total number of vaccinations showed a slight increase over the number performed last year. The number would have been much larger but for the very severe prevalence during the last autumn of fevers and other sickness, which caused a great infant mortality, and which left many children weak and unfit for vaccination. Not less than 17·62 per cent. of the operations were done by the dispensaries and of those more at Chiniot than at any other place.

The entries in the vaccinators’ returns are reported to be trustworthy. The Civil Surgeon visited 104 villages, during the year, and compared the village copies of the registers with the children vaccinated and found no fraud in any of them. A few mistakes detected were those of omission and not of commission.

The present Vaccine Establishment is reported by the Civil Surgeon to be too small to meet the requirements of the district. This will, be made the subject of separate correspondence.

Assistant Surgeon Chetan Shah deserves very great credit for the zeal and energy with which he has conducted his duties in connection with the vaccine work of his district, and I quite endorse the remarks of the Deputy Commissioner Captain Bartholomew made about him in the District Sanitary Report, viz: that “Chetan Shah, Rai Bahadur has been most successful in popularizing vaccination. He understands and sympathises with the people’s prejudices and has managed to overcome them.”

The Civil Surgeon has brought to notice certain native gentlemen in the district who rendered him useful assistance in promoting the cause of vaccination. Their names will be found in a list published in Section X of this Report.

MONTGOMERY.

Vaccination Establishment.

First Class Vaccinator	...	...	...	...	1
Second „	...	...	...	...	1
Third „ Vaccinators	...	...	...	...	4

Work performed during the year.

Population	...	...	...	...	426,529
Average population per square mile	...	...	...	...	64
Total vaccinations	...	...	...	...	9,630
Successful cases	...	...	...	...	9,202
Percentage of successful cases	...	...	...	...	95·64
Persons successfully vaccinated per 1,000 of population	...	...	...	...	21·58
Average number vaccinated by each vaccinator	...	...	...	...	1,926·00
					Rs. A. P.
Cost of each successful case	...	...	...	...	0 2 0

* But lately an inoculator from the Montgomery District inoculated children of several nomadic people living in the Jangli Bár and spread small-pox amongst those who were unprotected. To prevent the progress of the disease and to nip it in the bud, the Civil Surgeon with two permanent vaccinators, one compounder, and one temporary vaccinator, employed on the occasion went to the spot, and with the assistance of the civil authorities vaccinated as many people as could be found in and around the affected localities.

Vaccination in this district was carried on by tahsils. Work commenced on the 21st October 1882, the vaccinators being sent out to work in pairs. During the year 3 towns and 327 villages were overhauled. In the Tahsils of Kamalia and Dipalpur the Civil Surgeon Mr. Rehill examined a number of children that were vaccinated and found that the marks were very good, viz., 3 on each arm. In this district vaccination is carried on from arm to arm as much as possible, but at times the lymph is taken on glass. The practice of inoculation was detected in the Montgomery Tahsil and reported to the Deputy Commissioner on the 31st March 1883.

MUZAFFARGARH.

Vaccination Establishment.

Native Supervisor	...	...	...	...	1
First Class Vaccinators	...	...	...	...	2
Second „ Vaccinator	...	...	...	...	1
Third „ Vaccinators	...	...	...	...	3

Work performed during the year.

Population	...	...	...	...	338,605
Average population per square mile	...	...	...	...	98
Total vaccinations	...	...	...	...	8,564
Successful cases	...	...	...	...	8,081
Percentage of successful cases	...	...	...	...	94.65
Persons successfully vaccinated per 1,000 of population	...	...	...	...	23.89
Average number vaccinated by each vaccinator	...	...	...	...	1,223.42
					Rs. A. P.
Cost of each successful case	...	...	...	...	0 2 9

Mr. J. Connor, Civil Surgeon, states that the Tahsil of Sannawan was taken in hand at the beginning of the year. There was very little opposition met with in carrying on the work, other than the natural difficulty offered by a widely-scattered population, settled chiefly in families around the wells. Here and there the Hindus sometimes objected. The Muhammadans generally were anxious to have their children vaccinated. The method adopted was that from arm to arm, and the results were very satisfactory, the vesicles were large, progressed regularly, and numbered from 4 to 6 on each child, the greater number having 6. In Muzaffargarh Tahsil, also, little or no difficulty was experienced, a couple of Zaildars were indifferent, but on being reported to the Deputy Commissioner, they rendered effective aid. The results were as satisfactory as in the Sannawan Tahsil. The work in Alipur Tahsil was begun late in October. It was impossible to begin vaccination before the end of the month, on account of the exceedingly sickly state of children due to the prevalence of epidemic fevers, and even to the end of the year many children had to be left without vaccination. The vesicles were not as large and well formed as in other parts of the district. This part of the district has been the most difficult to vaccinate; the people did not seem generally anxious to have it done, and the Zaildars and Lambardars were not zealous except in a few instances.

As already stated, the arm to arm method was adopted. There was often much difficulty in carrying it out, owing to the objection of the parents to having lymph taken from their children's arms, and to going away from their homes for a day or two, money was given to parents to pay their expenses, but even this was often not effective except in the case of poor people. The vaccination was carried on by zails, which was found to be the easiest and surest way of getting all the children, and only detained one zaildar at a time from other works, the zails were worked consecutively from one to the next adjoining, and so on through the district. Mr. Connor personally inspected the greater number of the children vaccinated, moving in the wake of the vaccinators, guiding and procuring them the assistance of the zaildars, &c. The Assistant Surgeon of the Alipur dispensary assisted the Civil Surgeon very much in inspecting the work.

The names of the native gentlemen who rendered assistance in the vaccination work will be found in a list given in Section X of this Report.

The manner in which Mr. J. Connor supervised the vaccine operations in his district is highly creditable to him.

DERA ISMAIL KHAN.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	2
Third „ „	...	...	...	...	...	4

Work performed during the year.

Population	...	...	...	...	...	...	...	441,649
Average population per square mile	...	...	...	...	...	...	...	56
Total vaccinations	...	...	...	...	...	...	...	6,744
Successful cases	...	...	...	...	...	...	...	6,243
Percentage of successful cases	...	...	...	...	...	...	...	94.73
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	...	14.21
Average number vaccinated by each vaccinator	...	...	...	...	...	...	...	963.42
								Rs. A. P.
Cost of each successful case	...	...	...	...	...	...	...	0 3 11

The Civil Surgeon does not think the present vaccine staff sufficient to meet the requirements of the district. The towns and villages are very far from each other, and a village is broken up into small detachments of huts, a few near each irrigation well, thus rendering the task of the vaccinator very difficult and tedious. The people as a rule are not favorably disposed to help, and put in as much passive resistance as possible. A few of the headmen gave assistance, but others are quite indifferent.

The Civil Surgeon inspected the vaccine operations of eight villages, and found the work satisfactory, most of the cases being successful, very few partial failures, three on each arm being the rule.

DERA GHAZI KHAN.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	...	3

Work performed during the year.

Population	...	...	...	...	...	...	...	363,346
Average population per square mile	...	...	...	...	...	...	...	118
Total vaccinations	...	...	...	...	...	...	...	7,623
Successful cases	...	...	...	...	...	...	...	6,937
Percentage of successful cases	...	...	...	...	...	...	...	91.10
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	...	19.09
Average number vaccinated by each vaccinator	...	...	...	...	...	...	...	1,524.60
								Rs. A. P.
Cost of each successful case	...	...	...	...	...	...	...	0 3 10

Owing to the great prevalence of malarial fevers in the district during the autumn, great numbers of children were anæmic and weakly, and parents were in consequence loth to bring them for vaccination.

BANNU.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	...	1
Second „ „	...	...	...	...	...	...	...	1
Third „ Vaccinators	...	...	...	...	...	...	...	3

Work performed during the year.

Population	...	...	...	...	...	...	...	332,577
Average population per square mile	...	...	...	...	...	...	...	91
Total vaccinations	...	...	...	...	...	...	...	6,719
Successful cases	...	...	...	...	...	...	...	6,326
Percentage of successful cases	...	...	...	...	...	...	...	94.30
Persons successfully vaccinated per 1,000 of population	...	...	...	...	...	...	...	19.02
Average number vaccinated by each vaccinator	...	...	...	...	...	...	...	1,343.80
								Rs. A. P.
Cost of each successful case...	...	...	...	...	...	...	...	0 3 7

The Civil Surgeoncy being an additional charge in this district, the Civil Surgeon has been unable to go out into the district to inspect vaccine operations, he was unable to get away from his military duties owing to sickness amongst the troops. The vaccinators were sent to work by districts, and rules for their guidance were drawn out by the Civil Surgeon and were approved by the Deputy Commissioner.

PESHAWAR.

Vaccination Establishment.

Native Supervisor	...	...	...	...	...	...	...	1
First Class Vaccinator	...	...	...	...	...	...	...	1
Second „ Vaccinators	...	...	...	...	...	...	...	2
Third „ „	...	...	...	...	...	...	...	4

Work performed during the year.

Population	592,674
Average population per square mile	271
Total vaccinations	5,721
Successful cases	4,793
Percentage of successful cases	86.36
Persons successfully vaccinated per 1,000 of population	8.23
Average number vaccinated by each vaccinator	817.28
Rs. A. P.	
Cost of each successful case	0 5 7

In his report the Civil Surgeon Dr. Coates, remarks that "I do not consider the people of this district are opposed to vaccination. When the object is explained to them they are generally willing to have their children operated on." * * * *

The chief difficulty has been to persuade the people to allow the lymph to be taken so that it is not easy to keep up a supply. "I have frequently" he adds "found it impossible to get the parents to produce their children for my inspection as they feared, I had come to remove the lymph." In the district, vaccination was carried on by the vaccination staff, the lambardars in certain villages were reported by the Native Supervisor for not giving him any help in his work; the Deputy Commissioner was communicated with on each occasion, and this difficulty overcome for the time being, but although overcome it had caused delay and tended to diminish the number of persons vaccinated. The Civil Surgeon, however, reports that the people of this district are beginning to look more favorably on vaccination. He has been asked by several lambardars to send vaccinators to their villages during the year, and recently the native supervisor reported to the Civil Surgeon that some headmen in the Hashtnagar Tahsil wrote to him with a view to have inoculation, practised by certain means in their village, stopped.

HAZARA.

Vaccination Establishment.

Native Supervisor	1
Third Class Vaccinators	2

Work performed during the year.

Population	407,075
Average population per square mile	122
Total vaccinations	8,841
Successful cases	8,237
Percentage of successful cases	93.17
Persons successfully vaccinated per 1,000 of population	20.23
Average number vaccinated by each vaccinator	2,210.25
Rs. A. P.	
Cost of each successful case	0 1 9

The vaccinators were chiefly employed in vaccination work in the villages of the Haripur, Abbottabad, Manserah Tahsils. They worked throughout the year, except during the month of August. The Civil Surgeon has submitted his report in the form of a statement from which I have been able to ascertain that the work performed in each village is satisfactory.

KOHAT.

Vaccination Establishment.

Native Supervisor	1
First Class Vaccinator	1
Second „ „	1
Third „ Vaccinators	2

Work performed during the year.

Population	181,540
Average population per square mile	52
Total vaccinations	3,618
Successful cases	2,927
Percentage of successful cases	81.41
Persons successfully vaccinated per 1,000 of population	16.15
Average number vaccinated by each vaccinator	904.50
Rs. A. P.	
Cost of each successful case... ..	0 5 8

Vaccination was carried on in this district by tahsils. No report received from the Civil Surgeon regarding the manner in which the vaccination establishment worked under him. The rural population, is generally apathetic to vaccination. The people object to their vaccinated children being taken from village to village for the purposes of lymph. The vaccinators outside the Teri town met with the usual opposition though accompanied by the Nawab's agents.

VACCINATION IN NATIVE STATES.

There is at present no regular system of vaccination in Kashmir.

In the Bahawalpur State vaccination has been carried on satisfactorily. Mir Mumtaz Ali, Medical Officer to the State furnishes the following report on the working of the Vaccine Establishment during the year 1882-83 :—

“There were 11,075 vaccinations performed during the year, of which 9,694 were primary vaccinations, and 1,381 re-vaccinations, an increase of 4,893 over last year's work. Of the 11,075 operations, 8,014 were successful, or 82·67 per cent. The Bahawalpur State having six Tahsils under it, and the vaccinators to work in them being four only. Two extra vaccinators, on application to His Highness the Nawab, were sanctioned in the month of September 1882, and were attached to Khairpur and Nawashahar Tahsils respectively. The performance of vaccination in each of the Tahsils is left by the State to the care of Kardars in charge of the Tahsils, who accordingly carry out the orders of the State. The Hospital Assistants in charge of the several dispensaries generally examine the quality of the work done by the vaccinators. The people generally come forward for vaccination of their own accord. They are feeling well the benefits of vaccination, and every year shows a marked diminution of the ill opinion they bore for it.

There were three cases of small-pox in the Bahawalpur Regimental Hospital, of whom one died and the other two were cured. No small-pox appeared in the adjacent tahsils during the year.”

No report has as yet been received from the Deputy Sanitary Commissioner, Eastern Circle, in regard to the manner in which vaccination work was carried on in the Native States under his supervision. Under the orders of Government this department, as before stated, has no control over the vaccination work performed in the large Native States.

Faridkot.—His Highness Raja Bikrama Singh of Faridkot takes a very lively interest in promoting the cause of vaccination in his territory. The following extract from Dr. Doyle's report gives the details of the new system of vaccination recently introduced in the Faridkot State :—“His Highness, the Raja being desirous of starting a system of vaccination for the State, asked that some vaccinators might be sent temporarily to Faridkot for the purpose of instructing His Highness's subjects in vaccination.

“I proceeded to Faridkot on the 22nd December, taking some of my Special Staff with me. The State has a population a little under a lakh, the towns and villages numbering about 176. His Highness had some time previously entertained four vaccinators. I recommended that one of my vaccinators with two of His Highness's men should work in the Faridkot Division, that a second vaccinator of my staff with the two remaining men of His Highness's staff similarly attached should work in the Kot Kapura Division, while Mathra Das, my head vaccinator, should superintend and inspect the work. His Highness had these arrangements carried out. For each division the vaccinators were given a rough map, in which the position and name of every village was shown, also a list which gave the population of every village. His Highness also directed Sardar Jamiat Singh on the Kot Kapura side, and Sardar Khushal Singh in the Faridkot Division, to accompany the vaccinators and to use their influence in favor of vaccination. These Sardars rendered great assistance. Sardar Jamiat Singh's aid especially was invaluable. His Highness, indeed, in every way endeavoured to further the work as much as possible. 6,171 in all (from 22nd December to 28th February 1883) were vaccinated, of which 6,128 were primary vaccinations and 43 were re-vaccinations. Of the 6,128 primary vaccinations 5,999 were verified as successful. Percentage of successful cases (primary vaccination) 99·75. Re-vaccinations successful 20, unsuccessful 21, and unknown 2. The population of Faridkot is about 97,000. Over 60 per 1,000 have then been vaccinated successfully. On my return to Faridkot a month after my first visit I inspected 831 children. The results were : 718 had 6 vesicles, 43 had 5 vesicles, 21 had 4 vesicles, 35 had 3 vesicles, 11 had 2 vesicles, 3 unsuccessful. In Faridkot City the vesicles were only middling. In the villages they were good. In Faridkot a few children were re-vaccinated. The vesicles in these cases were very poor. I explained to His Highness that his staff of 4 men while more than sufficient as a working staff, yet did not provide for inspection of the work. As the inspection could be completed in about six weeks, it would obviously be very costly on the State to entertain a suitable man specially for this work. I suggested that eventually His Highness might find that two men as a working staff and with a head man to inspect and to assist in the work when necessary would be sufficient. At present, however, there is no one in the State suited to the position of supervisor. I therefore suggested to His Highness that he might for a year or so endeavour to arrange for inspection by a man trained in British territory. The matter rests here at present. It is evident, however, that the ultimate success of the work will depend in great measure on the efficiency of the inspection.”

NOTE.—The Vaccinations performed in the large Native States are not included in the returns of this Department.

VACCINATION IN CANTONMENTS.

In reply to a reference made from this office, Dr. O'Neill, Deputy Sanitary Commissioner, Eastern Circle, reports that on enquiries made it has been ascertained that Cantonment Vaccination is not carried out in this Circle, on any fixed or regular plan. In two Cantonments vaccinators are entertained, and in the others the work is performed by the District Staff or not performed at all. Neither does there appear to be any regularity in the submission of returns.

2. To each Medical Officer in charge of a Cantonment was submitted a series of questions and the following information has been elicited :—

Name of Cantonments.	What arrangements have been made for carrying on vaccination ?	What vaccination staff is entertained ?	What pay do the vaccinators receive ?	From what funds are they paid ?	What leave is generally granted them ?	What pay do they receive while on leave ?	What returns are compiled and to whom are they submitted ?
Dehli ...	Vaccination is carried out by the Station Hospital establishment.	...	...	...	...	...	Vaccination book is kept up at the Station Hospital.
Jullundur ...	District vaccinators.	...	...	...	...	...	...
Umballa ...	The officer in charge of Station Staff Hospital supervises and Police assist.	One vaccinator.	Rs. 15 per mensem.	Cantonment funds.	...	...	Monthly returns to Deputy Sanitary Commissioner.
Jotogh ...	No special arrangements.	...	...	...	...	...	Returns of Europeans submitted through Deputy Surgeon-General.
Solon	...	...	...	...	...	...	...
Kasauli	...	...	...	...	...	...	...
Dagshai	...	...	...	...	...	...	...
Sabathu ...	Native vaccinator.	One vaccinator.	Rs. 10 per mensem.	Cantonment funds.	As required.	...	Monthly return submitted to Sanitary Commissioner and Station Staff Officer.
Dalhousie ...	...	...	...	...	...	...	Annual return of vaccination of soldiers and families to Deputy Surg.-General.
Bakloh ...	Regimental Medical Staff.	...	...	...	...	...	Annual return to Deputy Surgeon-General.
Sialkot ...	District vaccinators under Civil Surgeon.	...	...	...	...	...	Returns included in the district return.
Dharmasala ...	Civil Surgeon lends a vaccinator.	...	...	...	...	...	Annual return to Surgeon-General.
Kangra ...	...	...	...	...	...	...	...

Dr. Doyle, the Deputy Sanitary Commissioner of the Western Circle, reports as follows regarding vaccination in the Cantonments of his Circle :—

“Peshawar and Mian Mir are the only Cantonments which have entertained a vaccinator. Though the matter rests with the Military authorities, I venture to make the following observations, which are based on applications for lymph received from the Medical Officers holding separate charges and acting in the matter independently.

(1) From the wordings of applications it would appear that in many cases a few people only were to be vaccinated at the time. In such a place as Lahore Fort this must necessarily be the case. (2) From this it is probable that a large proportion (though the actual number may be small) are vaccinated with stored lymph. (3) In such a case it is obvious that Medical Officers are under a disadvantage, and must meet with difficulties in securing satisfactory results. (4) It is probable that by suitable arrangements arm to arm vaccination might be more largely carried out in cantonments.”

The unsatisfactory state of vaccination in cantonments, as shown in the above correspondence demands a larger amount of interest in vaccination on the part of Cantonment Magistrates and Medical Officers than what they seem to have hitherto taken in the matter.

VACCINATION STATEMENTS,
1881-82.

A.—VACCINE

Statement No. 1 showing particulars of Vaccination in the Punjab performed by the Vaccinators of the

1	2	3	4	5	6	7			8
Number.	Name of District.	Circles and Districts.	Population of District according to Census of 1868.	Average population per square mile.	Average number of vaccinators employed throughout the season.	TOTAL NUMBER OF PERSONS VACCINATED.			Average number of persons vaccinated by each vaccinator.
						Male.	Female.	Total.	
1	DELHI.	Delhi Tahsil ...	315,286	...	...	50	34	84	...
		Do. Ballabgarh ...	125,667	...	...	532	457	989	...
		Total of District ...	608,850	496	3	582	491	1,073	357·66
2	GURGAON.	Tahsil Rewari ...	150,631	...	...	63	50	113	...
		Total of District ...	689,034	348	2	63	50	113	56·5
3	HISSAR.	Tahsil Barwala ...	66,199	...	...	351	328	679	...
		Total of District ...	484,681	137	4	351	328	679	169·75
4	SIRSA.	Tahsil Fazilka ...	66,970	...	...	189	161	350	...
		Total of District ...	210,795	68	4	189	161	350	87·5
5	LUDHIANA.	Tahsil Ludhiana ...	290,148	...	...	270	227	497	...
		Total of District ...	573,245	429	3	270	227	497	105·66
6	SIMLA.	Sanitarium of Simla ...	17,440	...	...	617	151	768	...
		Rural Circles ...	16,154	...	...	90	78	168	...
		Total of District ...	33,594	1,888	4	707	229	936	234
7	JULLUNDUR.	Tahsil Jullundur ...	260,885	...	...	692	639	1,331	...
		Total of District ...	794,764	596	4	692	639	1,331	332·75
8	KANGRA.	Tahsil Nurpur ...	124,780	...	...	5,111	4,448	9,559	...
		Do. Kangra including Sub-Tahsil of Palampur	210,223	...	...	6,342	7,132	13,474	...
		Tahsil Dera ...	126,350	...	...	4,682	4,925	9,607	...
		Do. Hamirpur...	179,961	...	...	15,775	14,950	30,725	...
		Do. Kulu ...	98,923	...	...	2,014	1,606	3,620	...
		Total of District ...	740,237	87	34	33,924	33,061	66,985	1,970·14
9	AMRITSAR.	Tahsil Amritsar ...	280,289	...	...	2,969	2,484	5,453	...
		Do. Tarn Taran ...	241,150	...	...	3,181	2,658	5,839	...
		Total of District ...	730,979	535	27	6,150	5,142	11,292	418·22
10	GURDASPUR.	Tahsil Pathankot ...	163,350	...	...	746	554	1,300	...
		Total of District ...	906,773	496	2	746	554	1,300	650

DEPARTMENT.

late Punjab Establishment during the six months, commencing 1st April and ending 30th Septr. 1881.

9	10	11	12	13	14	15	16	17	18	19	20	21
PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.	
Total.	Successful.			Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
	Under 1 year.	Over 1 and under 6 years.	Total of all ages.									
81	59	19	81	3	1	...	...	...	...	...	...	...
987	671	243	917	2	2	...	...	...	...	...	...	...
1,068	730	262	998	5	3	93.44	60	1.64	7,016.2	11.52	330.6	0.54
...
113	55	53	108	...	...	...	...	...	...	...	...	...
113	55	53	108	...	...	95.57	...	0.15	7,658.2	11.11	1,995.4	2.89
...
679	356	305	661	...	...	...	...	...	...	...	...	...
679	356	305	661	...	...	97.34	...	1.36	1,377.0	28.41	353	0.72
...
345	206	56	262	5	...	...	...	...	...	...	...	...
345	206	56	262	5	...	75.94	...	1.24	5,497.4	26.07	263.8	1.25
...
497	357	104	461	...	...	...	...	...	...	...	...	...
497	357	104	461	...	...	92.75	...	0.80	10,841.2	18.91	839.6	1.46
402	197	158	392	366	157	...	...	...	...	...	...	...
168	45	106	163	...	...	...	...	...	...	...	...	...
570	242	264	555	366	157	97.36	42.89	21.19	1,413.6	42.07	11	0.32
...
1,331	949	244	1,193	...	...	...	...	...	...	...	...	...
1,331	949	244	1,193	...	...	89.63	...	1.50	14,867	18.70	281.6	0.35
6,049	2,076	2,662	5,870	3,510	1,105	...	...	...	...	...	...	...
8,449	2,884	3,140	7,814	5,025	2,461	...	...	...	...	...	...	...
6,034	2,277	1,588	5,856	3,573	1,312	...	...	...	...	...	...	...
15,395	1,887	2,011	14,371	15,330	9,529	...	...	...	...	...	...	...
2,748	797	1,107	2,611	872	455	...	...	...	...	...	...	...
38,675	9,921	10,508	36,522	28,310	14,862	94.43	52.49	69.41	23,178.2	31.31	112	0.15
5,432	4,074	1,250	5,323	21	7	...	...	...	...	...	...	...
5,818	4,096	1,392	5,489	21	4	...	...	...	...	...	...	...
11,250	8,170	2,642	10,812	42	11	96.10	26.19	14.80	12,388.4	16.94	1,777.8	2.43
...
1,181	759	350	1,112	119	96	...	...	...	...	...	...	...
1.181	759	350	1,112	119	96	94.15	80.67	1.33	14,855	16.38	857	0.94

A.—VACCINE

1	2	3	4	5	6	7			8
Number.	Name of District.	Circles and Districts.	Population of District according to Census of 1868.	Average population per square mile.	Average number of vaccinators employed throughout the season.	TOTAL NUMBER OF PERSONS VACCINATED.			Average number of persons vaccinated by each vaccinator.
						Male.	Female.	Total.	
11	LAHORE.	Tahsil Kasur ...	197,667	...	...	800	660	1,460	...
		Total of District ...	789,666	218	3	800	660	1,460	486.66
12	FEROZEPORE.	Tahsil Zira ...	139,693	...	...	125	131	256	...
		Total of District ...	549,253	204	3	125	131	256	85.33
13	RAWALPINDI.	Tahsil Kahuta ...	82,348	...	...	372	271	643	...
		Do. Murree ...	32,647	...	...	250	75	325	...
		Total of District ...	711,256	114	5	622	346	968	193.6
14	GUJRAT.	Tahsil Kharian ...	190,005	...	...	183	145	328	...
		Do. Phalian ...	154,287	...	...	105	65	170	...
		Total of District ...	616,347	324	2	288	210	498	249
15	SHAHPUR.	Tahsil Shahpur ...	103,607	...	...	417	424	841	...
		Total of District ...	368,796	78	4	417	424	841	210.25
16	MOOLTAN.	Tahsil Sarai Sidhu ...	65,734	...	...	187	174	361	...
		Total of District ...	471,563	80	7	187	174	361	51.57
17	JHANG.	Tahsil Jhang ...	151,822	...	...	3	4	7	...
		Total of District ...	348,027	61	1	3	4	7	7
18	MUZAFFAR-GARH.	Tahsil Alipur ...	...	...	...	1,446	1,256	2,702	...
		Total of District ...	259,547	98	12	1,446	1,256	2,702	225.16
19	HAZARA.	Tahsil Manserah ...	109,415	...	...	796	711	1,507	...
		Do. Haripur ...	116,368	...	...	2,624	2,146	4,770	...
		Do. Abbott-abad ...	118,146	...	...	3,735	3,106	6,841	...
		Total of District ...	343,929	122	20	7,155	5,963	13,118	655.9
		TOTAL OF DISTRICTS ...	10,231,336	...	8.3	54,717	50,050	104,767	1,262.25

DEPARTMENT. — (continued).

9	10	11	12	13	14	15	16	17	18	19	20	21
PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.	
Total.	Successful.			Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
	Under 1 year.	Over 1 and under 6 years.	Total of all ages.									
1,460	896	413	1,309	...	...	...	...	...	...	...	...	...
1,460	896	413	1,309	...	...	89.65	...	1.65	12,518.2	15.85	1,811.8	2.29
256	191	58	250	...	...	...	...	...	...	...	...	...
256	191	58	250	...	...	97.65	...	0.45	10,755.2	19.58	76.4	1.38
643 151	450 97	171 43	621 140	... 174	......	......	......	......	......	......	......	......
794	547	214	761	174	...	95.84	...	1.06	17,808	25.03	870	1.22
328 170	208 123	99 40	307 163	.....	......	......	......	......	......	......	......	......
498	331	139	470	...	...	94.37	...	0.76	12,869	20.87	1,059.4	1.71
841	636	113	749	...	...	...	...	...	...	...	...	...
841	636	113	749	...	...	89.06	...	2.03	8,564	23.22	646.2	1.75
361	173	150	323	...	...	...	...	...	...	...	...	...
361	173	150	323	...	...	89.47	...	0.68	8,691.8	18.43	611.4	1.29
7	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	7,224	20.75	332.8	0.95
2,604	928	1,607	2,535	98	47	...	...	...	...	...	...	...
2,604	928	1,607	2,535	98	47	97.35	47.95	9.94	4,399.4	16.95	531.4	2.43
1,496 4,586 6,475	952 2,365 3,864	458 805 2,250	1,410 4,189 6,141	11 184 366	1 113 46	.........	.........	.........	.........	.........	.........	.........
12,557	7,181	3,513	11,740	561	160	93.49	28.52	34.60	1,669	4.85	313	0.91
75,087	32,628	20,995	70,821	29,680	15,336	94.31	51.67	8.42	195,983.8	19.15	13,858.2	1.35

A.—VACCINE

Statement No. I showing particulars of Vaccination in the Punjab performed by the Vaccinators of the

1	2	3	4	5	6	7			8	9
Number.	Name of District.	Circles and Districts.	Population of district according to Census of 1868.	Average population per square mile.	Average number of vaccinators employed throughout the season.	Total number of persons vaccinated.			Average number of persons vaccinated by each vaccinator.	PRIMARY
						Male.	Female.	Total.		
1		Patiala Native State ...	...	...	4	149	157	306	76.5	304
2		Bashahar „ ...	...	...	7	6,014	4,439	10,453	1,493.28	7,695
3		Bhagat „ ...	...	...	3	453	435	888	296	432
4		Jubal „ ...	...	...	4	756	521	1,277	319.25	1,253
5		Kumarsain „ ...	...	...	3	61	47	108	36	107
6		Lambagraon „ ...	...	...	6	594	871	1,465	244.16	1,010
7		Kutlahar „ ...	...	...	3	6,664	7,113	13,777	4,592.33	12,922
8		Nadaun „ ...	...	...	5	2,185	2,489	4,674	934.8	3,870
9		Guler „ ...	...	...	2	351	347	698	349	247
10		Balsan „ ...	...	...	4	117	126	243	60.75	240
11		Kuthahar „ ...	...	...	4	197	153	350	87.5	344
12		Umb „ ...	...	...	3	1,014	698	1,712	570.66	1,712
		Total of Native States	...	...	21	18,555	17,396	35,951	1,711.95	30,136
		Grand. Total ...	...	...	104	73,272	67,446	140,718	1,353.05	105,223

DEPARTMENT.—(concluded).

late Punjab Establishment during the six months, commencing 1st April and ending 30th Sept. 1881.

10	11	12	13	14	15	16	17	18	19	20	21
VACCINATION.			Re-vaccination.		Percentage of successful cases.		Persons successfully vaccinated per 1,000 of population.	Average number of persons successfully vaccinated during previous five years.		Average annual No. of deaths from small-pox during previous five years.	
Successful.			Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
Under one year.	Over one and under six years.	Total of all ages.									
65	249	304	2	...	100	...	...	659·4	...	...	...
1,893	4,567	7,279	2,753	2,071	94·59	75·08	...	1,650·6	...	...	...
87	341	432	456	189	100	41·44	...	86·6	...	...	...
110	1,011	1,225	24	4	97·76	16·66	...	168·2	...	...	...
16	76	104	1	1	97·19	100	...	377·8	...	...	...
458	228	865	455	151	85·64	33·18	...	951·2	...	...	...
490	2,076	1,241	855	505	95·50	59·06	...	142·6	...	...	...
281	898	3,609	804	482	93·25	59·95	...	842·8	...	...	...
179	65	246	451	168	99·59	37·25	...	169·8	...	...	...
5	201	237	3	...	98·75	...	...	70·2	...	...	...
45	242	334	6	...	97·09	...	...	...	...	...	...
628	928	1,612	...	...	94·15	...	...	...	...	...	...
4,257	10,882	28,588	5,815	3,571	94·86	61·41	...	5,119·2	...	...	...
36,885	31,877	99,409	35,495	18,907	94·47	53·26	...	201,103	...	...	...

VACCINE

Statement No. II showing particulars of Vaccination in the Punjab performed by the Vaccinators

1	2			3	4	5	6			7
Number.	DISTRICTS.			Population according to Census of 1868.	Average population per square mile.	Average number of vaccinators employed throughout the season.	TOTAL NUMBER OF PERSONS VACCINATED.			Average number of persons vaccinated by each vaccinator.
							Male.	Female.	Total.	
1	Delhi	...	...	608,850	496	9	6,511	5,676	12,187	1,354.11
2	Gurgaon	...	...	696,646	348	8	12,060	11,572	23,632	2,954.00
3	Karnal	...	...	610,927	264	10	8,895	8,374	17,269	1,726.90
4	Hissar	...	...	484,681	137	5	3,549	3,137	6,686	1,337.20
5	Rohtak	...	...	536,959	295	5	5,036	5,092	10,128	2,025.60
6	Sirsa	...	...	210,795	68	5	3,794	3,646	7,440	1,488.00
7	Umballa	...	...	1,008,860	394	11	10,805	10,669	21,474	1,952.18
8	Ludhiána	...	...	583,245	429	9	13,111	10,714	23,825	2,647.22
9	Simla	...	...	33,594	1,888	1	244	254	498	498.00
10	Jullundur	...	...	783,020	596	10	14,009	12,331	26,340	2,634.00
11	Hoshiárpur	...	...	938,890	450	12	12,693	10,992	23,685	1,973.75
12	Kángra	...	...	743,758	87	3	1,463	1,365	2,828	942.67
13	Amritsar	...	...	832,750	535	12	8,822	7,426	16,248	1,354.00
14	Gurdáspur	...	...	906,126	496	11	12,030	10,590	22,620	2,056.36
15	Siálkot	...	...	994,458	510	13	17,405	15,418	32,823	2,524.85
16	Lahore	...	...	775,551	218	10	15,319	12,771	28,090	2,809.00
17	Gujránwála	...	...	550,576	207	7	11,057	9,628	20,685	2,955.00
18	Ferozepore	...	...	533,416	204	8	9,144	8,312	17,456	2,182.00
19	Rawalpindi	...	...	699,647	114	12	13,629	10,793	24,422	2,035.17
20	Jhelum	...	...	500,988	128	7	7,723	7,302	15,025	2,146.43
21	Gujrát	...	...	616,347	324	9	15,424	13,261	28,685	3,187.22
22	Sháhpur	...	...	368,796	78	9	7,523	7,066	14,589	1,621.00
23	Mooltan	...	...	459,765	80	7	6,603	5,999	12,602	1,800.28
24	Jhang	...	...	348,027	61	8	5,755	4,797	10,552	1,319.00
25	Montgomery	...	...	359,437	64	6	5,379	4,293	9,672	1,612.00
26	Muzaffargarh	...	...	295,547	98	5	3,906	3,557	7,465	3,113.00
27	Dera Ismail Khan...	...	...	394,864	56	7	2,632	2,404	5,036	719.43
28	Dera Gházi Khan ...	...	...	309,978	118	6	8,842	7,720	16,562	2,760.33
29	Bannu	...	...	287,547	91	4	3,336	2,925	6,261	1,565.25
30	Pesháwar	...	...	500,443	271	7	4,017	1,871	6,131*	875.86
31	Hazára	...	...	367,218	122	4	2,509	2,098	4,607	1,151.75
32	Kohát	...	...	145,419	52	3	2,759	2,462	5,321*	1,773.66
Total for the Province ...				17,487,125	173	242	256,086	224,515	480,844	1,986.94

* The total of males and females does not agree with the total given for the districts.

DEPARTMENT.

of the District Establishment, from 1st October 1881 to 31st March 1882.

8	9	10	11	12	13	14	15	16	17	18	19	20
PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.	
Total.	Under 1 year.	Over 1 and under 6 years.	Total of all ages.	Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
12,126	6,931	3,564	10,495	61	33	86.55	54.10	17.24	...	...	339	0.56
23,579	13,181	9,733	22,914	53	21	97.18	37.73	32.89	...	...	1,759	2.52
17,265	9,987	6,042	16,029	4	3	92.84	75.00	26.24	...	...	1,631	2.67
6,686	5,227	1,165	6,392	...	...	95.60	...	13.19	...	...	331	0.68
10,121	5,241	4,493	9,734	7	3	96.18	42.85	18.13	...	...	402	0.75
7,433	5,332	1,576	6,908	7	5	92.94	71.43	32.77	...	...	226	1.07
20,967	11,899	7,624	19,523	507	318	93.11	62.72	19.35	...	...	1,743	1.73
23,806	16,536	6,959	23,495	10	8	98.69	42.10	40.28	...	...	734	1.26
371	99	248	347	127	37	93.53	29.13	10.33	...	...	7	0.21
26,325	20,158	4,663	24,821	15	9	94.29	60.00	31.70	...	...	285	0.36
23,685	18,039	4,613	22,652	...	...	95.64	...	24.13	...	...	566	0.60
2,828	2,430	380	2,810	...	...	99.36	...	3.78	...	...	107	0.14
16,242	13,652	1,730	15,382	6	6	94.70	100.00	18.47	...	...	1,628	1.95
22,609	17,686	3,157	20,843	11	6	92.19	54.54	23.00	...	...	859	0.95
32,763	27,018	4,846	31,864	60	28	97.26	46.67	32.04	...	...	781	0.78
27,988	17,076	9,345	26,421	102	15	94.40	14.70	34.07	...	...	1,696	2.19
20,641	17,880	2,040	19,920	44	12	96.51	27.27	36.18	...	...	771	1.40
17,456	9,807	7,366	17,173	...	...	98.38	...	32.20	...	...	593	1.11
24,145	17,481	5,880	23,361	277	88	96.75	31.77	33.39	...	...	856	1.22
15,001	11,411	2,770	14,181	24	1	94.53	4.17	28.31	...	...	561	1.12
28,594	18,562	8,017	26,579	91	67	92.95	73.63	43.12	...	...	1,058	1.70
14,584	10,798	3,391	14,189	5	4	97.29	80.00	38.47	...	...	590	1.60
12,568	4,747	7,079	11,826	34	10	94.10	29.41	25.72	...	...	560	1.22
10,399	8,285	1,759	10,044	158	72	96.59	47.06	28.86	...	...	257	0.74
9,668	8,058	1,269	9,327	4	4	96.58	100.00	25.98	...	...	984	2.74
7,368	5,865	1,225	7,090	97	73	96.23	75.26	23.99	...	...	663	2.24
5,015	1,782	2,726	4,508	21	5	89.89	23.81	11.42	...	...	1,030	2.61
16,539	6,270	9,013	15,283	23	8	92.40	34.78	49.30	...	...	416	1.34
16,244	3,523	2,490	6,013	17	10	96.30	58.82	20.91	...	...	887	3.08
6,022	2,301	2,883	5,184	109	56	86.08	51.38	10.36	...	...	817	1.63
4,606	3,271	950	4,221	1	...	91.64	...	11.49	...	...	282	0.77
5,305	2,722	2,084	4,806	16	1	90.59	6.25	33.19	...	...	170	1.17
478,949	323,255	131,080	454,335	1,895	892	94.86	47.07	26.03	...	...	23,590	1.35

VACCINE DEPARTMENT.

Statement No. III showing particulars of Vaccination performed by the Vaccinators of the Special Establishment of the Eastern and Western Circles, Punjab, during the year 1881-82 exclusive of those shown in Form Ia.

1	2	3	4	5	6	7			8	PRIMARY VACCINATION.				13 | 14		15	16		17	18	19	20	21
Number.	Name of District.	CIRCLES AND DISTRICTS.	Population according to Census of 1868.	Average population per square mile.	Average number of vaccinators employed throughout the season.	Total number of persons vaccinated.			Average number of persons vaccinated by each vaccinator.	Successful.				Re-vaccination.		Primary.	Re-vaccination.	Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous 5 years.	Ratio per 1,000.	
						Male.	Female.	Total.		Under 1 year.	Over one and under 6 years.	Total of all ages.	Total.	Successful.	No.				Ratio per 1,000.				
1		Eastern Circle.	...	...	...	9,341	8,204	17,545	...	17,226	7,635	9,132	16,658	319	50	96.70	15.67	...	...	...	...	...
		Umballa	...	...	...	3,579	3,515	7,094	...	7,079	5,461	1,500	6,961	15	2	98.33	13.33	...	...	...	...	...
		Hoshiárpur	...	...	...	2,501	2,150	4,651	...	4,602	3,459	997	4,456	49	18	96.83	36.73	...	...	...	...	...
3		Kángra	...	...	...	15,421	13,869	29,290	...	28,907	16,555	11,629	28,075	383	70	97.12	18.28	...	...	...	...	...
		Total	...	...	...															
1		Western Circle.	...	...	...	477	394	871	...	871	660	211	871	...	...	100.00	...	...	...	...	...	...
		Rawalpindi	...	...	...	6,023	5,548	11,571	...	11,571	8,620	2,940	11,560	...	...	100.00	...	...	...	...	...	...
		Jhelum	...	...	...															
2		Total	...	...	...	6,500	5,942	12,442	...	12,442	9,280	3,151	12,431	...	...	100.00	...	...	...	...	...	...
		Grand Total	...	...	...	21,921	19,811	41,732	...	41,349	25,835	14,780	40,506	383	70	97.96	18.28	...	...	...	...	...

Statement No. IV showing the Cost of the Vaccination Establishment in each District of the Punjab Province during the official year 1881-82.

Number.	DISTRICTS.	Pay of Establishment sanctioned by Government.	1881-82.											Number of successful vaccinations and re-vaccinations.	Average cost of each successful case.	Number.
			EXPENDITURE.				PAID FROM									
			Establishment.	Travelling Allowance.	Contingencies.	Total.	Provincial Funds.	Municipal Funds.	District Funds.	Cantonment Funds.	Total.					
1	Delhi ...	1,692	1,199	...	...	1,199	40	632	527	...	1,199	11,529	Rs. A. P.	0 1 7	1
2	Gurgaon ...	1,632	833	...	39	872	339	164	369	...	872	23,043	0 0 7		2	
3	Karnál. ...	1,632	689	...	58	747	...	...	747	...	747	16,032	0 0 8		3
4	Hissar ...	1,248	686	...	122	808	160	292	356	...	808	7,053	0 1 9		4	
5	Rohtak ...	1,188	386	...	20	406	...	20	386	...	406	9,737	0 0 8		5	
6	Sirsa ...	1,068	647	82	67	796	334	254	208	...	796	7,175	0 1 9		6	
7	Umballa ...	2,196	1,130	...	111	1,241	120	467	654	...	1,241	19,841	0 1 0		7	
8	Ludhiána ...	1,308	811	193	282	1,286	193	401	692	...	1,286	23,964	0 0 10		8	
9	Simla ...	684	45	...	1	46	46	...	...	...	46	1,096	0 0 8		9
10	Jullundur ...	1,932	1,014	...	55	1,069	38	482	549	...	1,069	26,023	0 0 7		10	
11	Hoshiárpur ...	1,992	882	...	39	921	...	460	461	...	921	22,652	0 0 7		11	
12	Kángra ...	1,752	249	...	11	260	...	260	...	...	260	54,194	0 0 1		12
13	Amritsar...	2,052	1,323	...	12	1,335	...	475	860	...	1,335	26,200	0 0 9		13	
14	Gurdáspur ...	1,872	890	...	33	923	...	306	617	...	923	22,057	0 0 8		14	
15	Siálkot ...	2,592	1,189	...	28	1,217	...	120	1,097	...	1,217	31,892	0 0 7		15	
16	Lahore ...	1,812	1,113	10	39	1,162	...	1,162	...	...	1,162	27,745	0 0 8		16
17	Gujránwála ...	1,308	538	...	...	538	...	286	252	...	538	19,932	0 0 5		17
18	Ferozepore ...	1,788	943	...	36	979	...	342	637	...	979	17,423	0 0 10		18	
19	Rawalpindi ...	1,812	911	2	...	913	200	247	466	...	913	24,210	0 0 7		19	
20	Jhelum ...	1,788	848	76	21	945	76	436	433	...	945	14,182	0 1 0		20	
21	Gujrat ...	1,968	826	...	30	856	...	...	856	...	856	27,116	0 0 6		21
22	Sháhpur ...	1,848	806	...	40	846	...	229	617	...	846	14,942	0 0 10		22	
23	Mooltan ...	1,248	857	...	24	881	108	580	193	...	881	12,159	0 1 1		23	
24	Jhang ...	1,068	744	...	49	793	...	70	723	...	793	10,116	0 1 3		24	
25	Montgomery ...	1,044	538	...	16	554	143	82	329	...	554	9,331	0 0 11		25	
26	Muzaffargarh ...	924	651	...	104	755	616	24	115	...	755	9,745	0 1 2		26	
27	Dera Ismail Khan ...	1,728	1,140	...	...	1,140	252	345	543	...	1,140	4,513	0 4 0		27
28	Dera Gházi Khan ...	1,548	932	...	10	942	168	267	507	...	942	15,291	0 0 11		28	
29	Bannu ...	1,404	791	...	...	791	...	315	476	...	791	6,023	0 2 1		29
30	Pesháwar ...	1,248	613	...	117	730	...	300	340	90	730	5,240	0 2 2		30	
31	Hazára ...	1,548	457	...	...	457	...	247	210	...	457	16,121	0 0 5		31
32	Kohát ...	1,284	689	...	...	689	123	566	...	...	689	4,807	0 2 3		32
	Total ...	50,208	25,370	363	1,364	27,097	2,956	9,831	14,220	90	27,097	541,384	0 0 9			

B.—DISPENSARY AND CANTONMENT VACCINATION.

Statement No. IV showing Dispensary and Cantonment Vaccination in the Punjab during the year 1881-82 exclusive of those shown in form Ia.

1	2	3	4	5	6	7	8	9	10	11	12	13
DISTRICTS.	Number of dispensaries in each district to which a vaccinator is attached.	Average number of vaccinators attached to dispensaries during the season.	Total number of persons vaccinated.	Average number of persons vaccinated by each vaccinator.	PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.	
					Total.	Successful.			Total.	Successful.	Primary.	Re-vaccination.
						Under one year.	Over one and under six years.	Total of all ages.				
Lahore	1	5	222	44·40	217	145	56	201	5	2	92·62	40·
Dera Ismail Khan ...	5	8	515	64·37	485	203	172	407	30	20	83·91	66·66
Házara	2	3	670	223·33	667	543	72	615	3	3	92·20	100·
Gular State ... ..	...	...	312	...	312	274	27	310	...	...	96·47	...
Baháwalpúr State ...	4	4	6,182	1545·50	5,740	3,079	1,584	4,753	442	383	82·80	86·65
Total	12	20	7,901	...	7,421	4,244	1,911	6,286	480	408	84·70	85·00
Umballa Cantonment...	1	1	1,304	1,304	1,283	675	537	1,212	21	18	94·47	85·71
Meean Meer do. ...	1	1	778	778	679	303	318	621	99	73	91·45	73·73
Sabathu do.	1	1	210	210	170	113	44	157	40	28	92·35	70·00
Total	3	3	2,292	...	2,132	1,091	899	1,990	160	119	93·34	74·37
GRAND TOTAL ...	15	23	10,193	443	9,553	5,335	2,810	8,276	640	527	86·63	82·34

VACCINATION STATEMENTS,

1882-83.

VACCINE

Statement No. I showing particulars of Vaccination in the Punjab Province performed

1 Number.	2			3	4	5	6			7
	DISTRICTS.			Population according to Census of 1881.	Average population per square mile.	Average number of vaccinators employed through out the season.	TOTAL NUMBER OF PERSONS VACCINATED.			Average number of persons vaccinated by each vaccinator.
							Male.	Female.	Total.	
1	Delhi	...	...	643,515	496	10	9,120	8,243	17,363	1,736·30
2	Gurgaon	...	...	641,848	348	9	7,769	7,123	14,892	1,654·66
3	Karnál	...	...	622,621	264	9	7,207	7,080	14,287	1,587·44
4	Hissar	...	...	504,183	137	5	5,500	4,951	10,451	2,090·20
5	Rohtak	...	...	553,609	295	7	7,942	7,462	15,404	2,200·57
6	Sirsa	...	...	253,275	68	6	4,578	4,059	8,637	1,439·50
7	Umballa	...	...	1,067,263	394	13	9,692	9,960	19,652	1,511·69
8	Ludhiána	...	...	618,835	429	8	9,819	8,307	18,126	2,265·75
9	Simla	...	...	42,945	1,888	1	581	331	912	912·00
10	Jullundur	...	...	789,555	596	12	12,303	10,659	22,962	1,913·50
11	Hoshiárpur	...	...	901,381	450	13	12,652	11,563	24,215	1,862·69
12	Kángra	...	...	730,845	87	4	2,742	2,297	5,039	1,259·75
13	Anritsar	...	...	893,266	535	13	9,890	8,012	17,902	1,377·07
14	Gurdáspur	...	...	823,695	496	11	12,893	11,493	24,386	2,216·90
15	Siálkot	...	...	1012,148	510	14	19,362	17,166	36,528	2,609·14
16	Lahore	...	...	924,106	218	11	12,219	10,485	22,704	2,064·00
17	Gujránwála	...	...	616,892	207	8	11,060	9,585	20,645	2,580·62
18	Ferozepore	...	...	650,519	204	8	13,168	11,478	24,646	3,080·75
19	Rawalpindi	...	...	820,512	114	10	8,873	6,623	15,496	1,549·60
20	Jhelum	...	...	589,373	128	8	4,972	4,206	9,178	1,147·25
21	Gujrat	...	...	689,115	324	10	13,209	11,543	24,752	2,475·20
22	Shahpur	...	...	421,508	78	8	5,757	5,507	11,264	1,408·00
23	Mooltan	...	...	551,964	80	7	9,873	8,299	18,172	2,581·71
24	Jhang	...	...	395,296	61	9	6,581	5,563	12,144	1,349·33
25	Montgomery	...	...	426,529	64	5	5,228	4,402	9,630	1,926·00
26	Muzaffargarh	...	...	338,605	98	7	4,453	4,111	8,564	1,223·42
27	Dera Ismail Khan	...	...	441,649	56	7	3,781	2,963	6,744	963·42
28	Dera Gházi Khan	...	...	363,346	118	5	4,119	3,504	7,623	1,524·60
29	Bannu	...	...	332,577	91	5	3,458	3,261	6,719	1,343·80
30	Pesháwar	...	...	592,674	271	7	3,527	2,194	5,721	817·28
31	Hazára	...	...	407,075	122	4	4,711	4,130	8,841	2,210·25
32	Kohát	...	...	181,540	52	4	2,016	1,602	3,618	904·50
	Total for the Province	...	...	18,842,264	173	258	249,055	218,162	467,217	1,810·91

DEPARTMENT.

by the Vaccinators of the District Establishment during the year 1882 and 1883.

8	9	10	11	12	13	14	15	16	17	18	19	20
PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.	
Total.	Under 1 year.	Over 1 and under 6 years.	Total of all ages.	Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000	Number.	Ratio per 1,000
17,075	9,615	4,458	16,103	288	138	94.30	47.91	25.23	...	...	340	0.53
14,850	9,060	5,293	14,353	42	37	96.65	88.09	22.42	...	...	1,759	2.74
14,280	9,965	2,840	12,805	7	2	89.67	28.57	20.57	...	...	1,631	2.62
10,451	4,943	5,150	10,098	...	...	96.62	...	20.03	...	...	331	0.66
15,394	9,872	5,062	15,034	10	6	97.66	60.00	27.16	...	...	402	0.73
8,632	6,567	2,488	8,355	5	1	96.79	20.00	32.99	...	...	227	0.90
19,397	12,363	5,417	17,878	255	130	92.16	50.98	16.87	...	...	1,743	1.63
18,111	16,197	1,790	17,990	15	7	99.33	46.66	29.08	...	...	734	1.19
684	157	485	644	228	115	94.15	50.43	17.67	...	...	7	0.16
22,945	19,794	1,749	21,543	17	10	93.88	58.82	27.29	...	...	285	0.36
24,188	19,372	3,963	23,346	27	12	96.51	44.44	25.91	...	...	566	0.63
5,039	2,628	2,279	4,907	...	...	97.38	...	6.71	...	...	107	0.15
17,579	14,647	2,198	16,845	323	204	95.81	63.15	19.08	...	...	1,623	1.82
24,384	18,043	3,893	21,936	2	1	89.96	50.00	26.63	...	...	859	1.04
36,500	29,954	6,095	36,049	28	2	98.76	7.14	35.60	...	...	781	0.77
22,665	19,044	2,625	21,670	39	7	95.60	17.94	23.45	...	...	1,696	1.83
20,623	17,793	1,760	19,562	22	4	94.85	18.18	31.71	...	...	771	1.25
24,646	14,277	10,175	24,473	...	...	99.29	...	37.62	...	...	593	0.91
15,150	13,318	1,388	14,706	346	156	97.06	45.08	18.11	...	...	856	1.04
9,164	7,517	924	8,441	14	10	92.11	71.42	14.33	...	...	561	0.95
24,701	19,876	2,895	22,771	51	15	92.18	29.41	33.06	...	...	1,058	1.53
11,252	9,364	1,535	10,899	12	1	96.86	8.33	25.85	...	...	590	1.40
18,082	7,306	10,207	17,513	90	31	97.43	34.44	31.78	...	...	560	1.01
12,039	8,893	2,746	11,648	105	35	96.75	33.33	29.55	...	...	257	0.65
9,621	7,517	1,685	9,202	9	6	95.64	66.66	21.58	...	...	984	2.31
8,537	6,681	1,399	8,081	27	10	94.65	37.03	23.89	...	...	663	1.96
6,590	2,389	3,854	6,243	154	34	94.73	22.07	14.21	...	...	1,030	2.33
7,614	3,610	3,327	6,937	9	1	91.10	11.11	19.09	...	...	416	1.14
6,708	3,165	3,161	6,326	11	...	94.30	...	19.02	...	...	887	2.67
5,550	1,761	2,518	4,793	171	89	86.36	52.04	8.23	...	...	817	1.38
8,840	7,624	613	8,237	1	1	93.17	100.00	20.23	...	...	282	0.69
3,595	1,873	1,054	2,927	23	5	81.41	21.73	16.15	...	...	170	0.94
464,886	335,220	105,026	442,315	2,331	1,070	95.14	45.90	23.53	...	...	23,590	1.25

A.—VACCINE

Statement No. II showing particulars of Vaccination performed by the Vaccinators of the Special

1	2	3	4	5	6	7			8
Number.	Name of District.	Circles and Districts.	Population according to Census of 1881.	Average population per square mile.	Average number of vaccinators employed throughout the season.	TOTAL NUMBER OF PERSONS VACCINATED.			Average number of persons vaccinated by each vaccinator.
						Male.	Female.	Total.	
1	UM-BALLA.	EASTERN CIRCLE.	Information not available.	Ditto.	Ditto.				Information not available.
1	UM-BALLA.	Umballa Town ...							
2		Simla Tahsíl ...							
3		Kot Khai ...							
4	SIMLA.	Jutogh Cantonment ...							
5		Dagshai Do. ...							
6		Subáthu Do. ...							
7		Kasauli Do. ...							
8		Kalka Do. ...							
9	LUDHIANA.	Ludhiána Town ...							
10		Kángra Town ...							
11		Haripur Do. ...							
12		Sujanpur Do. ...							
13		Jawalamukhi Do. ...							
14	KANGRA.	Kángra Tahsíl ...							
15		Hamirpur Do. ...							
16		Dera Gopipur Tahsíl ...							
17		Kuthár Native State ...							
18		Hamirpur Do. ...							
19		Mailogh Do. ...							
20		Tomba Do. ...							
21		Nadaun Do. ...							
22		Dhomi Do. ...							
23		Nalagarh Do. ...							
24		Baghat Do. ...							
25		Bhija Do. ...							
26		Paliála Do. ...							
27		Pataudi Do. ...							
28		Loháru Do. ...							
29		Dujána Do. ...							
30		Kalsia Do. ...							
31		Rámpur Do. ...							
32		Dhami Do. ...							
		Total ...							
1	LAHORE.	WESTERN CIRCLE.							
		Kasur Tahsíl ...							
2		Murree Tahsíl ...							
3		Kahuta Do. ...							
4		Gujar Khan Do. ...							
5		Abbott-abad Tahsíl ...							
6		Haripur Do. ...							
7		Mansahra Do. ...							
8		Hazára Do. ...							
		Total ...							
		Grand Total ...							

NOTE.—The Vaccination Return of the Western Circle for March

DEPARTMENT.

Establishment of the Eastern and Western Circles, Punjab during the year 1882-83.

9	10	11	12	13	14	15	16	17	18	19	20	21
PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.		Persons successfully vaccinated per 1,000 of population.	Average annual number of persons successfully vaccinated during previous five years.		Average annual number of deaths from small-pox during previous five years.	
Total.	Successful.			Total.	Successful.	Primary.	Re-vaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
	Under 1 year.	Over 1 and under 6 years.	Total of all ages.									
39	36	3	39	100·00	...	Information not available.	Ditto.	Ditto.	Ditto.	Ditto.
113	40	46	101	...	...	98·38	...			
432	107	259	389	...	...	90·05	...			
31	20	4	30	33	9	96·77	27·27					
56	17	11	40	...	...	71·43	...			
22	15	6	22	...	...	100·00	...			
28	13	11	24	...	...	85·71	...			
39	14	25	39	...	...	100·00	...			
10	6	4	10	...	...	100·00	...			
139	103	19	133	...	...	95·68	...			
11	11	...	11	...	...	100·00	...			
108	91	9	100	2	...	92·59	...					
222	184	19	208	...	...	93·69	...			
3,359	2,460	721	3,202	4	...	95·33	...					
2,938	2,441	353	2,812	...	...	95·71	...			
368	290	45	337	...	...	91·58	...			
315	227	151	292	...	...	92·70	...			
248	144	50	194	...	...	78·22	...			
687	194	471	674	12	12	98·11	100·00					
1,194	859	281	1,151	3	...	96·40	...					
190	157	26	183	...	...	96·31	...			
91	21	47	71	...	...	78·02	...			
2,791	698	1,954	2,730	29	15	97·81	51·72					
363	120	132	321	34	22	88·43	64·70					
145	13	58	109	...	...	75·17	...			
212	39	137	181	...	...	85·37	...			
765	263	475	738	...	...	96·47	...			
766	279	433	712	11	3	92·95	27·27					
574	221	258	530	...	...	92·33	...			
2,131	614	1,393	2,032	...	...	95·35	...			
74	33	39	72	...	...	97·30	...			
870	48	249	846	97	50	97·24	51·54					
19,331	9,778	7,689	18,333	225	111	94·83	49·33					
559	457	102	559	...	...	100·00	...			
1,475	1,130	337	1,466	8	...	99·38	...					
2,353	1,696	569	2,265	1	1	96·26	100·00					
2,040	1,638	137	1,775	6	3	87·00	50·00					
1,027	819	105	924	34	3	89·97	8·82					
47	46	1	47	...	...	100·00	...			
1,079	958	121	1,079	...	...	100·00	...			
1,596	1,362	102	1,464	...	...	91·72	...			
10,176	8,106	1,474	9,579	49	7	94·13	14·28					
29,507	17,884	9,163	27,912	274	118	94·59	43·06					

has not yet been received in this office.

CANTONMENT VACCINATION.

Statement No. III showing Cantonment Vaccination in the Punjab during the year 1882-83.

1	2	3	4	5	6	7	8	9	10	11	12	13
CANTONMENTS.	Number of Cantonment in each district to which a vaccinator is attached.	Average number of vaccinators attached to Cantonment during the season.	Total number of persons vac-cinated.	Average number of persons vac-cinated by each vaccinator.	PRIMARY VACCINATION.				RE-VACCINATION.		PERCENTAGE OF SUCCESSFUL CASES.	
					Total.	Successful.			Total.	Successful.	Primary.	Re-vaccination.
						Under one year.	Over one and under 6 years.	Total of all ages.				
Meean Meer	1	542	...	482	204	245	449	60	41	93·15	68·33
Umballa	1	2,130	...	1,898	1,091	731	1,822	232	175	96·00	75·43
Sabathu	1	27	...	27	15	10	25	...	...	92·59	...
Total	3	2,699	899·66	2,407	1,310	986	2,296	292	216	95·38	73·97

Statement No. IV showing the cost of the Vaccination Establishment in each district of the Province during 1882-83, is under preparation.

Statement No. IV showing the Cost of the Vaccination Establishment in each District of the Punjab Province during the official year 1882-83.

Number.	DISTRICTS.	Pay of Establishment sanctioned by Government.	1882-83.												Number.
			EXPENDITURE.				PAID FROM					Number of successful vaccinations and re-vaccinations.	Average cost of each successful case.		
			Establishment.	Travelling Allowance.	Contingencies.	Total.	Provincial Funds.	Municipal Funds.	District Funds.	Cantonment Funds.	Total.				
1	Delhi ...	1,692	1,988	...	37	2,025	...	1,093	932	...	2,025	16,241	Rs. A. P.	1	
2	Gurgaon ...	1,632	1,531	...	54	1,585	...	303	1,282	...	1,585	14,390	0 1 9	2	
3	Karnál ...	1,632	1,632	77	433	2,142	4	210	1,928	...	2,142	12,807	0 2 8	3	
4	Hissar ...	1,248	1,488	...	117	1,605	...	894	711	...	1,605	10,098	0 2 6	4	
5	Rohtak ...	1,188	1,124	...	141	1,265	...	97	1,168	...	1,265	15,040	0 1 4	5	
6	Sirsa ...	1,068	1,164	454	88	1,706	454	734	518	...	1,706	8,356	0 3 3	6	
7	Umballa ...	2,196	2,480	...	190	2,670	...	900	1,770	...	2,670	18,008	0 2 4	7	
8	Ludhiána ...	1,308	1,769	227	136	2,132	226	842	1,064	...	2,132	17,997	0 1 10	8	
9	Simla ...	684	180	...	3	183	61	122	...	...	183	759	0 3 10	9
10	Jullundur ...	1,932	2,402	...	74	2,476	...	1,107	1,369	...	2,476	21,553	0 1 10	10	
11	Hoshiárpur ...	1,992	2,140	...	84	2,224	...	1,112	1,112	...	2,224	23,358	0 1 6	11	
12	Kángra ...	1,752	938	...	41	979	...	979	...	...	979	4,907	0 3 2	12
13	Amritsar ...	2,052	2,473	226	115	2,816	228	672	1,916	...	2,816	17,049	0 2 7	13	
14	Gurdáspur ...	1,872	2,082	...	101	2,183	...	757	1,426	...	2,183	21,937	0 1 7	14	
15	Siálkot ...	2,592	2,559	41	27	2,627	41	215	2,371	...	2,627	36,051	0 1 1	15	
16	Lahore ...	1,812	2,289	...	84	2,373	...	2,373	...	...	2,373	21,677	0 1 9	16
17	Gujránwála ...	1,308	1,608	...	155	1,763	793	970	...	...	1,763	19,566	0 1 5	17
18	Ferozepore ...	1,788	1,750	190	53	1,993	190	600	1,203	...	1,993	24,473	0 1 3	18	
19	Rawalpindi ...	1,812	2,075	5	125	2,205	...	1,496	709	...	2,205	14,862	0 2 4	19	
20	Jhelum ...	1,788	1,779	227	32	2,038	227	906	905	...	2,038	8,451	0 3 10	20	
21	Gujrát ...	1,968	1,933	...	50	1,983	...	...	1,983	...	1,983	22,786	0 1 4	21
22	Sháhpur ...	1,848	1,852	...	34	1,886	...	937	949	...	1,886	10,900	0 2 9	22	
23	Mooltan ...	1,248	1,728	...	61	1,789	...	1,261	528	...	1,789	17,544	0 1 7	23	
24	Jhang ...	1,068	1,208	...	45	1,253	1,125	128	...	...	1,253	11,683	0 1 8	24
25	Montgomery ...	1,044	1,138	...	32	1,170	...	232	938	...	1,170	9,208	0 2 0	25	
26	Muzaffargarh ...	924	1,338	...	81	1,419	1,194	205	20	...	1,419	8,091	0 2 9	26	
27	Dera Ismail Khan ...	1,728	1,728	...	35	1,763	...	828	935	...	1,763	6,277	0 4 6	27	
28	Dera Gházi Khan ...	1,548	1,550	...	39	1,589	...	689	900	...	1,589	6,938	0 3 8	28	
29	Bannu ...	1,404	1,400	...	58	1,458	...	304	1,154	...	1,458	6,326	0 3 8	29	
30	Pesháwar ...	1,248	1,738	...	53	1,791	...	300	1,311	180	1,791	4,882	0 5 10	30	
31	Hazára ...	1,548	960	...	20	980	...	534	446	...	980	8,238	0 1 10	31	
32	Kohát ...	1,284	1,280	...	...	1,280	...	1,280	...	...	1,280	2,932	0 6 11	32
Total ...		50,208	53,304	1,449	2,598	57,351	4,543	23,080	29,548	180	57,351	443,385	0 2 0		

SECTION VIII.

No Remarks.

SECTION IX.—SANITARY WORKS—CIVIL.

49. THE following information has been received from the Secretary to Government, Punjab, Public Works Department, regarding Water-Supply and Drainage schemes in progress or under consideration in the Punjab Province during the year 1882 :—

SIMLA WATER WORKS.

To meet the great demand for storage room for water at Simla during the dry months of the year the construction of a large reservoir at Sanjauli has been sanctioned in connection with the Simla Water Works. The site for the reservoir has been cleared, and about one-third of the concrete foundation laid, but owing to frost work had to be stopped during the winter months. Arrangements have, however, been made to push on the work vigorously as soon as it can safely be recommenced. The cost of this reservoir will, it is anticipated, be Rs. 180,420.

AMRITSAR.

The sanitary improvements at Amritsar are three-fold, namely :—

1. Pure Water-supply.
2. Intra-mural drainage.
3. Extra-mural do.

In connection with the first two, the Punjab Government has entrusted Mr. Leslie Clarke with the preparation of a project to supply the city with wholesome water and provide for its drainage. This project is now in hand, and fair progress has been made with it. It is intended to draw the supply of water from three wells of 20 feet diameter, sunk 600 feet apart and parallel to the bank of the Bari Doab Canal, and situated near the Sultan Vind bridge over that canal. These wells will be connected by a sunk masonry passage, which will empty the water into a fourth well from which it will be pumped by steam power over a high pressure service tower and distributed through iron pipes. To enable Mr. Clarke to obtain the necessary data regarding yield and purity of water and most suitable position for these supply wells, the Executive Engineer is at present sinking an experimental well 20 feet in diameter. Work on this was somewhat delayed owing to want of sufficient weights to sink the masonry, but this has now been arranged for, and at the close of the year the well had been sunk 9 feet, the spring level having been reached at 8 feet.

The project for the intra-mural drainage is also in hand. The city sewage will be conducted into the ditch round the city, which has been deepened 9 feet to admit of a proper flow from all connected sewers, and from it will be conducted in an egg-shaped sewer to settling tanks to be constructed at about 3,500 feet from the city walls, where the solid contents will be allowed to settle and the liquid to flow away into the system of extra-mural drainage.

The Amritsar Municipality have further undertaken to drain the Tung Dhab (hollow) in the city, in which water constantly collects, by improving the channel connecting it with the Gurutallah Nallah.

The extra-mural drainage will be carried out by the Public Works Department, and a project for this work is now under preparation and nearly completed. It consists of a main drainage cut commencing in low ground to the South-West of the village of Kirka, and passing round the South side of the city to the Hydiara Nallah, which is about 12 miles to the West. The existing city drain will be utilized for a length of six miles. Into this main channel will fall two subsidiary channels, one draining the ground between the Canal Rajbaha and the Amritsar and Pathankot Railway Station at Kirka, and the other will carry off water lying along the Grand Trunk Road. The total length of drains to be constructed will be about 20 miles, and the cost of the work at Rs. 210,000.

The above are the principal works of a sanitary nature that were in hand during the year under review, but a number of other works of a petty character were also either completed or in progress, namely :—

Completed during the year.

1. Filling in excavations in Native Cavalry lines, Dera Gházi Khan.
2. Restoring the level of the ditch at Fort, Dalipgarh.
3. Improving drainage from drinking water reservoir at Tank.

In progress.

4. Improving drainage of Fort, Dalipgarh.
5. Water reservoir at Zam outpost.
6. Covered drinking water tank at Draband Post.

50. The statement overleaf shews the Income and Expenditure of the Municipal towns in each district of the province during the year 1882 :—

Statement of Income and Expenditure of Municipal towns.

TABLE showing the Income and Expenditure of Municipalities

Number.	Names of Districts.	Number of Municipal towns in each District.	ASSETS.			DISBURSE						
			Balance from previous year.	Actual income for the year.	Total.	Conservancy Establishment.	Paving.	Roads and bridges.	Drainage or sewerage.	Water-supply including clearing and repair of wells, tanks, &c.	Widening of streets.	Construction of latrines.
1	Delhi ...	5	81,760	308,339	390,099	49,565	2	30,393	2,755	2,117	60	1,909
2	Gurgaon ...	7	47,052	65,207	112,259	9,126	3,151	11,049	732	1,248	10	1,572
3	Karnál ...	5	12,871	58,198	71,069	7,154	5,500	3,241	5,899	538	...	413
4	Hissar ...	6	46,333	58,380	104,713	12,770	...	8,704	1,412	111	...	300
5	Rohtak ...	6	15,351	34,397	49,748	5,418	1,404	4,199	389	717	...	161
6	Sirsa ...	5	30,454	41,605	72,059	2,518	2,586	713	3,138	2,662	...	...
7	Umballa ...	11	47,496	77,812	125,308	12,348	3,692	7,384	2,037	2,530	...	357
8	Ludhiána ...	6	58,841	81,569	140,410	17,625	...	2,922	1,730	882	941	1,089
9	Simla ...	1	8,353	156,938	165,291	20,928	...	16,883	2,299	2,538	23,133	...
10	Jullundur ...	11	19,290	73,050	92,340	12,101	6,227	2,322	2,573	943	...	895
11	Hoshiarpur ...	10	24,931	49,736	74,667	9,861	4,003	971	533	689	...	27
12	Kángra ...	6	9,933	21,039	30,972	1,546	1,181	2,848	...	1,164	...	...
13	Anritsar ...	6	160,383	325,816	486,199	69,045	...	40,869	43,292	17,913	7,782	...
14	Gurdáspur ...	15	28,966	62,459	91,425	8,330	4,042	2,552	854	2,358	...	520
15	Siálkot ...	9	22,115	58,581	80,696	5,371	3,272	1,389	440	4,583	...	62
16	Lahore ...	7	36,840	537,556	574,396	33,270	1,407	64,605	82,561	36,749	...	354
17	Gujránwála ...	10	23,663	71,330	94,993	10,111	7,654	2,775	1,773	205	...	...
18	Ferozepore ...	8	25,340	52,572	77,912	4,993	2,592	9,953	496	1,018	...	186
19	Rawalpindi ...	5	88,748	107,353	196,101	21,298	5,984	4,186	1,393	5,880	190	90
20	Jhelum ...	4	64,510	49,257	113,767	10,005	625	6,211	2,833	2,598	...	1,980
21	Gujrat ...	4	13,635	23,677	37,312	3,896	1,949	1,530	513	218	...	...
22	Shahpur ...	6	28,783	33,138	61,921	6,198	1,225	1,313	168	450	...	...
23	Mooltan ...	6	56,724	118,842	175,566	16,084	6,809	25,364	1,964	3,141	...	231
24	Jhang ...	5	22,261	36,340	58,601	6,112	2,317	666	1,366	1,875	...	244
25	Montgomery ...	5	8,798	19,064	27,862	2,045	...	...	157	115	495	39
26	Muzaffargarh ...	10	7,529	23,271	30,800	4,755	1,432	90	472	1,255	70	608
27	Dera Ismail Khan ...	6	16,881	56,400	73,281	9,381	2,200	1,147	813	210	2,000	...
28	Dera Gházi Khan ...	5	15,944	43,833	59,777	9,103	4,059	3,071	1,857	1,132	...	329
29	Bannu ...	4	16,156	30,323	46,479	7,283	746	288	923	1,002	...	114
30	Pesháwar ...	2	16,921	184,777	201,698	22,974	...	4,564	4,932	25,209	550	473
31	Hazára ...	4	12,683	18,559	31,242	2,214	...	853	563	83	...	...
32	Kohát ...	1	19,450	15,968	35,418	2,848	...	372	6,816	659	...	141
TOTAL ...		201	1,088,995	2,895,386	3,984,381	416,276	74,059	257,427	177,683	122,792	35,231	12,094

in each District of the Punjab Province during the year 1882.

MENTS.							Total expended.	Balance unexpended.	REMARKS.
Repairs of latrines.	Total sanitary charges.	Vaccination.	Dispensaries.	Police.	Schools.	Miscellaneous.			
111	86,912	1,249	13,259	65,364	8,005	185,340	360,129	29,970	
636	27,524	362	6,402	14,402	4,605	15,606	68,901	43,358	
...	22,745	156	2,444	15,452	3,679	12,898	57,374	13,005	
275	23,572	609	324	1,035	259	33,445	59,304	45,409	
336	12,624	20	1,756	8,384	3,858	11,409	33,051	11,697	
80	11,697	638	5,947	5,465	3,801	10,140	37,688	34,371	
552	28,900	689	4,393	14,154	4,462	16,993	69,591	55,717	
1,873	27,062	943	5,930	12,193	12,652	22,045	80,825	59,585	
373	60,154	120	20,208	9,346	1,000	64,403	155,231	10,060	* Other Public Works charges.
252	25,313	1,142	3,899	15,601	7,923	10,471	64,439	27,901	
160	16,244	594	4,915	10,956	3,287	13,329	48,425	26,242	
...	6,739	401	3,736	2,478	1,618	3,804	18,776	12,196	
532	179,433	763	28,040	56,094	16,824	134,906	416,060	70,139	
6	18,662	825	5,128	10,928	7,896	17,253	60,692	30,733	
134	15,251	187	3,798	10,095	5,987	11,463	46,781	33,915	
389	219,335	338	11,146	43,248	8,327	101,692	384,586	189,810	
43	22,561	868	5,631	9,371	5,768	15,772	59,971	35,022	
38	19,276	721	4,036	7,567	3,935	11,620	47,155	30,757	
61	39,082	1,183	11,960	13,049	4,294	25,191	94,759	101,342	
351	24,603	1,026	7,509	10,816	4,321	18,377	66,652	47,115	
46	8,152	...	1,750	6,513	770	6,894	24,079	13,233	
93	9,447	647	4,757	10,498	3,739	10,543	39,631	22,290	
183	53,776	1,218	9,094	23,344	7,728	43,459	143,619	31,947	
70	12,650	40	5,247	5,938	4,007	6,744	34,626	23,975	
130	2,981	...	5,193	1,743	3,999	4,540	18,456	9,406	
55	8,737	146	2,821	4,042	2,862	7,338	25,946	4,854	
125	15,876	828	5,522	7,464	4,196	28,556	62,442	10,839	
234	19,785	803	3,218	6,192	3,726	15,807	49,531	10,246	
103	10,459	322	2,644	6,805	1,683	13,270	35,183	11,296	
298	59,000	305	57,909	30,269	1,967	48,780	198,230	3,468	
70	3,783	581	538	4,407	711	5,958	15,978	15,264	
119	10,955	705	801	5,274	5,080	7,102	29,917	5,501	
7,728	1,103,290	18,989	249,955	452,677	152,969	935,148	2,913,028	1,071,353	

The Income, inclusive of last year's balance, it will be seen, was Rs. 3,984,381, and the Expenditure Rs. 2,913,028.

The amount expended on sanitary works, including the Conservancy establishment, was as follows:—

1. Conservancy establishment	...	...	...	...	Rs. 416,276
2. Paving	...	...	...	...	74,059
3. Roads and bridges	...	..	...	...	257,427
4. Drainage and sewerage	...	...	...	...	177,683
5. Water-supply, including cleaning and repairing of tanks, wells, &c.	...	...	...	...	122,792
6. Widening streets	...	...	...	...	35,231
7. Construction of latrines	..	...	...	...	12,094
8. Repairs of latrines	...	...	...	...	7,728

Total Rs. ... 1,103,290

51. The following is a brief history of the sanitary progress made during 1882 in the Municipal towns of the Province epitomised from the reports received from the Deputy Commissioners:—

DELHI.

Drainage.—Surface drains were constructed on both sides of the Turkoman and Chitli Kabar roads, as also in Kucha Pati Ram and Galli Shidi Kasim. Many of the smaller streets were supplied with side drains, and several minor drains were repaired and made more effective. The work of cleaning the city drains is in progress.

The amount expended under this head up to 31st December 1882 was Rs. 774, but as the work usually continues till the end of April, the total expenditure will be much larger. The Chandni Chauk, sewers have again been cleaned and flushed with fresh canal water, and are in a satisfactory state.

A detail of the new drains constructed is given as follows:—

Ganda Nalla road, Bangla Said Firoz, Galli Kanchni, Turkoman bázár, Chitli Kabar bázár Paewálá to Chatta Shahji, Ajmere to Turkoman gate, drains to latrine in Ward No. viii, Kuchá Pati Ram, Galli Shidi Kasim, Pipal Mahadeo Kucha in Ward No. xi, and Galli Taksalia in Ward No. ix. Seven large drains were also repaired.

The following new roads were constructed:—

Bajri road from Alipur to Rajpur road, Bajri road from Paewala to Chatta Shahji, and kankar road Bara Hindu Rao. Fifteen *bajri* and *kankar* roads within Municipal limits were entirely remodelled and renewed, and eight of the existing roads were repaired and put into proper order.

In the towns of Sonapat and Balabgarh a few public streets were metalled and side drains constructed. Some expenditure has been incurred in filling up depressions and hollows in these towns.

In Najafgarh one of the principal bázárs is being metalled and drained.

Water-Supply.—No new wells have been sunk, but some of the old ones have been cleaned and others repaired.

The Water-works scheme is held in abeyance pending disposal of certain questions appertaining to the carrying out of the project.

In the minor Municipal towns the water-supply is obtained entirely from wells. The water is fairly good and suitable for drinking purposes. Where necessary, wells have been cleaned and repaired and drains for removing the surface water constructed. On the whole the wells within Municipal limits are in fair order.

Conservancy.—Many of the old *jafri* latrines in the suburbs were renewed, and others repaired. Ten new urinals were constructed in the *gullies* and *kuchás*, and some old ones repaired. The only change affected in the system of conservancy was the abolition of intra-mural dépôts, so that in consequence, the conservancy carts carry the night-soil direct from the city to the extra-mural dépôts, and it is there deposited in pits until thoroughly deodorized, after which it is sold to the cultivators of the district. The Committee are making every effort to improve the sanitation of this city. Seventy extra conservancy carts have been added to the number reported last year, making in all 250 carts. With this number in regular use the Committee are in a position to undertake the entire removal of the city night-soil. The *jafri* latrines at Sonapat have been replaced by four latrines of *kacha-pacca* masonry. Carts have also been provided for the removal of filth in all the minor Municipal towns except Najafgarh. The establishment is sufficient and when properly supervised is efficient.

Latrines.—There were 43 public latrines in working order at the close of the year, viz.,—City 13, Sabzi Mandi 7, Sadr bázár 13, Pahárganj 12, and Civil Lines 2. There were also 16 public latrines in working order in the following towns:—Sonepat 4, Ballabgarh 4, Faridábad 4, and Najafgarh 4. Two more latrines have been sanctioned for the town of Najafgarh.

The income derived from the sale of manure during the two past years is shewn as below :—

	1881.	1882.
Delhi	Rs. ...	Rs. 911 0 0
Sonepat	... 107 8 0	134 8 0
Ballabgarh	... ..	12 0 0
Faridabad	... 19 1 0	...
Najafgarh	... ..	...
Total Rs.	... 126 9 0	Rs. 1,057 8 0

GURGAON.

Rewari.—Ten culverts on the Circular road, and in various parts of the town have been constructed for the more effectual carrying off of rain-water. The District Engineer has devised an improved system of drainage for the whole town, filling up the old deep drains and replacing them with shallow surface drains. The work was nearly finished at the close of the year.

One of the female latrines has been rebuilt on an improved plan, and one specimen urinal constructed.

Metalling of road leading from the Circular road through the Dharnhera gate to the tahsíl Raising and metalling of road leading from the Gokal bázár to the Saharanwas gate, and up to the Railway line. Tej Singh's *takia* has been thrown open to the road, and a public garden laid out for the recreation of the town's people. Metalling road leading from the Circular road through the Kutabpur gate to meet road from Gokal bázár. Metalling and draining the street leading from the Gokal bázár to the Bawal gate, and up to the Circular road. Metalling a road from the tahsíl to the Jagan gate.

Palwal.—Masonry drains have been made for carrying off water from the Kanungo quarters, and in the paving of several new streets, a better system of drainage has been provided.

One female latrine has been constructed and one slaughter-house for sheep and goats.

Paving main street of the Kanungo Mohalla. Paving street known as Nimtalla Mohalla. Metalling and otherwise improving the grain market.

Sohna.—Similar improvements to the drains, as in the case of the town of Palwal, have been effected here also, and a masonry outlet for carrying off the overflow of the hot spring into a neighbouring nallah has been constructed.

Three latrines and two slaughter-houses for kine and goats have been constructed.

The paving of the principal bázárs begun three years ago have been completed, and a new outdoor dispensary erected.

Hodal.—The bázárs have been paved and drained, and one latrine constructed.

Metalling the two principal bázárs and paving one street with stone slabs.

Nuh.—One latrine constructed.

Farakhnagar.—One slaughter-house for sheep and goats constructed.

Ferozepore.—Paving a portion of one of the principal bázárs and metalling one of the main streets. One slaughter-house for sheep and goats constructed.

Water-supply.—All wells and tanks in the Municipal towns were cleaned out.

Latrines.—The number of public latrines in working order during the year under report were :—Rewari 8, Palwal 6, Farakhnagar 6, Ferozepore 3, Sohna 5, Nuh 4, Hodal 4, Gurgaon 6, Nagina 4, Punahana 3, Hathin 4, Pinangwan 3, and Hasanpur 4.

The refuse is buried in trenches of regular size, or else stored within enclosure walls, where it is allowed to remain till it becomes fit for manuring purposes, and then sold, if purchasers can be found.

The income derived from the sale of manure during the past two years, was Rs. 337 in 1881 and Rs. 372 in 1882.

KARNAL.

	Rs.
<i>Karnal</i> .—Improving Ganda Nalla and Hatu Nalla	430
Paving streets	1,721
Raising roads	85
<i>Kaithal</i> .—Thanesar bázár road with pacca side drains	444
Kasai gate bázár	1,666
Paving streets	2,110
Construction of bridges	380
Do. of slaughter-house platforms	108
Do. of a wall near Bidkidar tank	318
Filling up ditch	40
<i>Pundri</i> .—Bhatan street road	1,340
Habri gate street	346
Jotshi street	325
Paving streets	2,028
<i>Pánipat</i> .—Paving streets	3,491
Raising roads	62
<i>Kunjpura</i> .—Paving streets	1,221

Water-supply.—The water-supply in all the towns is derived from wells and tanks. They are properly cleaned and are in good order. Rs. 538 have been expended on cleaning wells and repairing tanks in Pánipat, Kaithal and Púndri.

Other improvements.—In sixty villages manure yards have been established outside the village. At Karnál, Pánipat and Kunjpura manure depôts have been selected at a suitable distance for the deposit of the town manure and the public sweepings. In Kaithal and Púndri the filth is used for burning bricks, and is removed to the kilns by the sweepers.

Latrines.—There are 10 public latrines at Karnál and 8 at Panipat in working order.

No income was derived from the sale of manure during the past two years.

HISSAR.

	Rs.
<i>Bhiwáni</i> .—Pavement in Ramganj street	239
Ditto in Guariya Mohalla	243
<i>Hissar</i> .—Construction of platforms for vegetable sellers	63
<i>Fatahabad</i> .—Construction of 2 latrines	300

Drainage.—All the drains were thoroughly cleaned out and properly repaired. The following sums were expended on this work :—Hissar Rs. 116 ; Bhiwáni Rs. 1,196 ; Fatahabad Rs. 100.

A new drain has been constructed at Bhiwáni Municipality at an outlay of Rs. 1,000.

Water-supply.—There is little under this head to record. There are a sufficient number of wells and tanks, and the water-supply is ample except at Bhiwáni. The aggregate sum of Rs. 111 has been spent in cleaning out and repairing wells. All the wells are reported to be in good order.

Conservancy.—The conservancy arrangements of all the Municipal towns are satisfactory, and each Municipality has, as far as its funds permit, sufficient establishment to keep the town clean.

Latrines.—The following is a detail of the number of latrines in each Municipality, all of which are in good working order :—Hissar 4, Hãnsi 4, Bhiwáni 27, Fatahabad 4, and Ratia 2. Two new latrines have been constructed at Fatahabad at a cost of Rs. 300. All latrines are annually repaired, and during the year an aggregate sum of Rs. 275 was spent for this purpose. The refuse is taken from latrines and conveyed by means of conservancy carts, or in baskets to filth trenches, which are sufficiently deep and wide, as required by the sanitary rules.

The following is the detail of the income derived from the sale of manure during the two past years in each Municipality of the district :—

	1881.	1882.
Hissar	Rs. 130 6 0	Rs. 70 0 0
Hãnsi	" 18 0 0	" 19 0 0
Bhiwáni	" 227 0 0	" 525 0 0
Fatahabad	" 8 0 0	" 12 8 0
Ratia and Tohána ... ..	...	...
Total Rs.	383 6 0	Rs. 626 8 0

ROHTAK.

	Rs.
<i>Rohtak.</i> —Construction of a drain on either side of the road leading from the Delhi gate to the newly built gate	329
Completion of a <i>boali</i>	200
Metalling two roads, one leading to the Harya gate and the other to Babar Sultan gate	510
Paving a street in Mohalla Kaithán	64
Metalling a road in Ganj, and constructing a bridge	47
<i>Beri.</i> —Construction of a drain near Ganda Johar	29
Ditto of a wall to the tank called Ghangsar	351
Construction of a trough to a well	80
Paving five streets	834
Construction of a bridge	150
Metalling eleven roads	1,274
Paving surface round two wells	255
Filling in depressions near the Fair ground	80
Additions to a latrine	161
<i>Gohána.</i> —Construction of an enclosure wall to a slaughter-house	20
<i>Jhajjar.</i> —Paving surface round two wells	50
<i>Bahádargarh.</i> —Paving a street	100
Metalling two roads	400

The number of public latrines in working order were as follows :—Rohtak 5, Jhajjar 9, Beri 5, Bahádargarh 2, Kharkhanda 2, and Gohána 2.

The refuse is disposed of in the manner stated in last year's report, that is, in *Khattas* or pits dug for the purpose at a distance of some 200 yards from the towns.

No income has been derived from the sale of manure during the two past years. The efforts made to dispose of the stock in hand of the Municipal Committee of Rohtak met with no success. The system of storing dry-earth near every latrine is carried out.

SIRSA.

Fázilka.—A good deal has been done in the way of paving, draining and other improvements at Fázilka, which is the only town well off for funds. Four houses have been bought up and pulled down to increase the Dispensary garden, which is greatly improved.

In this town several good packa drains have been constructed through the bázárs. One new well has also been built and four repaired.

There are only two latrines in Fázilka, but they are built too far from the town.

Sirsa.—The town ditch has been repaired and hollows filled up at Sirsa. A drain has also been constructed at a cost of Rs. 1,200 to carry off the water that used to accumulate near the Sikh temples. Platforms for wells have also been built, and a *ghat* added to one of the tanks.

There are 3 latrines in this town, which are in charge of 7 sweepers, on Rs. 3 per mensem each.

Ellenabad and Rania.—At Ellenabad and Rania, wells have been repaired. In the district the District Committee have contributed aid to the sinking of 9 new wells and 2 new tanks.

In this district no income has been derived from the sale of manure.

UMBALLA.

One latrine has been constructed at Ladwa during the year. Some improvements have also been made to pavements and roads at the towns of Umballa, Jagádhri, Thanesar, Shahábad, Rúpar, Buriya, Ládwa and Kharar.

There has been no change in the drainage and water-supply system in force in any of the Municipal towns of the district.

Conservancy.—The following is the establishment entertained in the several Municipalities in the district :—

<i>Umballa.</i> —Sweepers 58, pakhalis 15, bhisti 1	
<i>Jagádhri.</i> — Do. 40 do. 12	
<i>Thanesar.</i> — Do. 16 do. 4	
<i>Shahabad.</i> — Do. 17 do. 6	
<i>Rúpar.</i> — Do. 22 do. 5	
<i>Sadhoura.</i> — Do. 16 do. 2	
<i>Buriya.</i> — Do. 17	
<i>Ladwa.</i> — Do. 9 do. 2	
<i>Kharar.</i> — Do. 11 do. 2	
<i>Pehowa.</i> — Do. 10	
<i>Radour.</i> — Do. 6	

Latrines.—There are 49 public latrines in working order. Refuse is used by agriculturists and *kumhars*. In Rúpar and Kharar the contract system is in force, but in other towns it cannot be enforced owing to arrangements made at time of settlement.

The income derived from the sale of manure at Rúpar and Kharar for the two past years is as follows :—

	1881.	1882.
Rúpar ...	Rs. 100	Rs. 138
Kharar ...	„ 10	„ 10
Total Rs. ...	110	Rs. ... 148

LUDHIANA.

No new works were undertaken or completed during the past year, but all the drains were repaired in the several Municipalities of the district.

The water-supply is derived from wells, which are kept clean and have covers which are closed when not in use. One part of the town gets its supply from the Budha Nallah, over which a sentinel is placed to see that no filth is thrown into the stream.

Walled enclosures are in course of construction for the deposit of night-soil, and verandahs to slaughter-houses have been erected as planned by the Sanitary Commissioner.

The income derived from the sale of manure during the past two years was, namely, Rs. 5,079 in 1881, and Rs. 4,320 in 1882. The increase in 1881 is due to several years' collection being disposed of at once.

SIMLA.

Drainage.—Rs. 2,300 have been spent during the year on the repairs of drains. The drainage of the town of Simla is as efficient as it can well be without a proper system of sewage drains. The Deputy Commissioner is glad to be able to report that there is now every hope that this urgent need will soon be supplied. Plans and estimates of a complete system, on the plan suggested by Major Nisbet, by which the sewage from the main bázár, as well as from Chota Simla and Boileauganj, will be carried in iron pipes into the ravine to South of Simla, have been received by the Committee, and a trial length of sewage pipe has already been laid. It is hoped that during the year 1883, great progress towards the completion of the drainage scheme will be made. It is in contemplation to improve the house drains in the bázár, by insisting on owners of houses and shops using iron pipes of an approved pattern.

On the above subject, however, Mr. J. W. Macnabb, the Commissioner of the Umballa Division offers the following remarks in his letter No. 99, dated 14th April 1883 :—

“ I have the honor to forward in original the Sanitary Report of the Deputy Commissioner of Simla for 1882, and to take this opportunity of again pressing my views on the subject of the disposal of the night-soil proper of Simla, which, I have previously brought to the notice of Government and of the Municipal Committee particularly, in my No. 353, dated 27th September 1881.

2. I entirely agree with Major Nisbet's plan of carrying the night-soil away by hand in iron buckets or *kiltas*, and depositing it in depôts, from which it is to be carried in iron pipes down the hill.

3. But where Major Nisbet proposed, and I believe this is the plan now before the Committee, to carry the night-soil by the pipes down into the ravines, notably the waterfall ravine. This plan utterly ruins the most beautiful part of Simla—a stream so beautiful that if it were in Wales or Cumberland, a railway would be made specially to take tourists to see it.

4. This, however, is the least of the objections.

5. It runs great risk of making the waterfall valley and the river further down permanently unhealthy.

6. And lastly it is a sad misuse of valuable material.

7. Instead of carrying the night-soil down into the ravines, I would carry it in pipes down to the lower spurs, and there trench it, in the cultivated or culturable ground.

8. The land is all outside of Simla boundaries ; but a successful experiment at one point would soon lead to its adoption all round Simla, where there must be ample hillsides capable of being terraced and then trenched.

9. The late Lieutenant-Governor did not think there was sufficient land for the purpose.

10. I hardly think this is conclusive. The land though scattered must be of very large extent, and even if half or a fourth of the night-soil was so utilized it would be *pro tanto* a very great gain.”

Water-supply.—The new water-supply continues to be the greatest boon to Simla. But the somewhat diminished supply during last hot season showed the necessity for increasing it. It is much to be regretted that the second reservoir at Sanjauli is not yet complete. The work is in charge of the Department of Public Works, and has proceeded very slowly.

Other improvements.—The Municipal Committee have resolved on the following important sanitary improvements :—

1.—To prohibit the keeping of horses, cows, goats, and poultry within the limits of the bázár, except in places set apart for the purpose.

2.—To prohibit coolies or day labourers, of whom the number now congregating in Simla is enormous, from living in the bázár. Barracks, on an approved plan, will be immediately erected for them at various selected sites away from the centre of the station.

It is also in anticipation to move for a bye-law to prevent overcrowding in the bázárs. The bázárs are overcrowded to such a degree that 10 or 15 men can be found huddled together in a low-room 11 or 12 feet square. What would be the consequence of an epidemic in such places is too horrible to contemplate. The Deputy Commissioner says, that he is sure the time has come when we should interfere in this matter, and there should be no squeamishness in declaring that such huddling together of human beings will be deemed penal on the part of the house-owners or tenants. The matter is not free from difficulty; but the difficulties must be met, for the evil has now reached a very serious and dangerous height.

Conservancy.—The system in operation introduced in 1878 has been described previously. It has worked, the Deputy Commissioner thinks, well and regularly. It will be greatly improved when the new sewage scheme above alluded to has been carried out. There has been sometimes a difficulty about getting sweepers, of whom a full supply is absolutely essential to the good sanitary condition of Simla. Their wages have been raised from Rs. 5 to 5-8 and 6, and they are very independent. They have all to be imported from the plains, as hill-men cannot be got to do this work. This makes it all the more necessary that the sewage scheme, which will enable us to dispense with a certain proportion of sweepers, should be speedily completed.

There are 30 latrines in working order, and it is proposed to increase their number. The refuse is mostly thrown into the stream in the ravine South of Simla, or carried down to Badhaighát, 4 miles out of Simla, and then thrown into a deep ravine. A small portion of latrine filth is buried in the Annandale Gardens where it proves a very successful manure, and another portion that is removed from Chota Simla is buried in trenches down the hill to the East of Chota Simla. There is a considerable area of trenched ground there, and it is expected to get a crop off it this season. The Deputy Commissioner is much in favor of burying latrine filth and thus using it as manure. Hitherto this has not been done with much success in Simla; but he has hopes that renewed efforts will shew that something may be done in this way, and that means for observing the natural order, *the rainfall to the river, the sewage to the soil*, may yet be found, and that more and more of the filth of Simla may be gradually disposed of in this way.

No manure is sold. There is, unfortunately, no demand for latrine filth as manure. The hill people have not learned to use it.

JULLUNDUR.

During the year under report, the work commenced in March 1880, which was fully reported previously, has been finished, and the last item of expenditure (Rs. 380) has been paid. By this project two wells for flushing the drains have been sunk, and a few side drains have been improved; the total estimate amounted to Rs. 2,423.

Another project for reducing two of the principal street drains to proper levels, in order to ensure a proper flow from the wells has been completed at a cost of Rs. 1,421, and as means permit, the levels of all the principal drains will be gradually corrected. The storm-water drains towards the Beyn were cleared out at an expenditure of Rs. 487. A large public tank at Jullundur has been cleared out at a cost of Rs. 400.

Bangah.—The construction of a channel round the town to drain off the storm-water was completed during the year. The estimate amounts to Rs. 1,790, of which Rs. 1,200 have been disbursed from Municipal funds, the remainder will be paid next year from District fund contribution. An estimate of Rs. 930, for the improvement of the sewage drainage of the town has been framed, and provision for the work made in the Budget for 1883-84.

Extensive repairs to streets and roads were effected at nearly all the towns.

Water-supply.—During the year the wells of the town of Jullundur were cleaned out at a cost of Rs. 411, as also those at Kartarpur, Adampur and Banga.

Conservancy.—Two new male latrines were constructed at Phillour for Rs. 396; one at Banga and another at Nakodar were also constructed on new sites.

There are 98 public latrines in working order, or two more than the last year, of which 24 are portable. The refuse is used as manure for lands.

The income derived during the past two years from the sale of town sweepings was:—

1881.	1882.
Rs. 1,210	Rs. 1,007

HOSHIARPUR.

There are 10 Municipal towns in this district. There were 9 last year to which Garshankar was added in September. This town is situated at the base of the Siwalak hills, some 4 miles distant, and about 25 miles from Hoshiarpur itself.

Hoshiárpur.—The Mohalla Sathi drain was repaired, and also that of Mohalla Tahli. There are a good many repairs going on now, but they will be reported on next year. The repairs to the Mohalla Sathi and Mohalla Tahli drains were estimated to cost Rs. 185. Rs. 45 were paid out of this, and the balance will be paid now, as the works have just been completed.

All the wells in Hoshiárpur were cleaned out, and those wanting repairs were repaired. This cost the Committee Rs. 1,213, out of which Rs. 471 were paid during the year, and the balance in January 1883. The pavement of the Kashmiri Katra bázár in Hoshiárpur was repaired at a cost of Rs. 1,420, and Garhi street was also paved at a cost of Rs. 1,411. Similar works were also executed in other Municipalities.

Hariána.—Repairs to drains, estimated at Rs. 220 are in progress.

Mukerián.— Do. do. do. „ 250 do. do.

At Mukerián wells were also cleaned out, and a well at Dasúya repaired.

During the year Rs. 1,217 were spent from District funds for the construction of one tank, and repairing and improving ten. These tanks are used for watering cattle, and in places where there are no wells for drinking purposes.

The total number of public latrines now in working order are 50 against 47 in the last year, namely, in Hoshiárpur 19, Hariána 9, Garhdiwála 2, Una 2, Tanda 6, Mukerián 3, Dasúya 4, Miáni 2, Garhshankar 3. Besides these there are 10 moveable latrines.

No income is derived from the refuse of latrines, but the street sweepings yielded in 1881 Rs. 434 and in 1882 Rs. 462. Native agriculturists do not use night-soil as manure.

KANGRA.

Paving Dharmsála bázár	...	...	...	Rs. 200
Do. Kángra do.	...	...	...	„ 981

With the exception of Dharmsála, Kángra and Núrpur, there are no drains; those in existence are kept clean and in good order.

The *Manikal* in Dharmsála, is a large water-supply work, which supplies the whole station and barracks with water. The general condition of the sources of water-supply in the district is good. Wells and *baolis* are kept clean.

There are only two latrines at upper and lower Dharmsála in working order, the refuse of which is removed by the sweepers, and buried at a spot selected for the purpose. The private latrines in other towns are kept clean.

No village committees are appointed in this district; but the Deputy Commissioner in his recent tours has spoken to lambardárs and kotwáls (Police Inspectors) on the subject, and the matter is receiving more attention.

The income derived from the sale of manure during the past two years was only Rs. 8-3-0.

AMRITSAR.

Drainage.—The main drain is nearly complete and the internal drainage of the town is constantly being improved. The filling in of the city ditch has seriously been taken in hand by the Municipal Committee. A large sum was spent on constructing bridges for the drainage of the Civil Lines.

Water-supply.—A scheme to supply Amritsar with pure water is being prepared by Government which, when complete, will be made over to the Committee to carry out. The wells and some of the city tanks were pumped out during the year. The people believe that the well water has much improved in consequence.

Conservancy.—The Municipal Committee of Amritsar have imported a Tramway for the removal of the town sweepings.

Tarn Táran and Jandiála.—The internal drainage of these towns has been much improved during the year, and the roads have been metalled.

Latrines.—In Amritsar there are 13 latrines in which the dry-earth system is in force. The night-soil is removed far away from the city in carts.

The income derived from the sale of manure during the year was, viz: Amritsar, Rs. 25,400; Jandiála, Rs. 286; Tarn Táran, Rs. 1,490; Majitha, Rs. 323; and Ramdás Rs. 58.

GURDASPUR.

Gurdáspur.—Two manure godowns built; repairs to wells, and pavings of streets; water supplied to a tank; and 14 drains repaired.

Dinanagar.—One drain built at Mughrali gate and six drains repaired; one new well completed and three repaired; two latrines for men and two for women built; and three bridges at each gate of the town built.

Batála.—One drain built and twelve repaired; steps of Shamsher Khanwála tank repaired; wells cleaned and repaired, and water supplied to Colonel Lake's tank; 12 manure godowns in progress; town wall and pavings of 6 streets repaired; one road metalled; a room for butchers built; Telegate road repaired; and one *baradari* of Shamsher Khanwála tank repaired. The slaughter-house near the Lake tank has been placed under the supervision of Revd. F. H. Baring, and the owners have been directed to raise the surrounding walls and to be careful not to allow offal and bones to accumulate.

Fatahgarh.—Three drains repaired; 20 wells cleaned and repaired; 4 manure godowns built, and one trench filled in; one street paved.

Kot-naina.—Two drains repaired; pavings of two streets repaired.

Kalánaur.—One drain repaired; 5 manure godowns built, and estimates sent up for carrying off superfluous drainage of the town.

Patháankot.—A staircase built on Nalwa stream, and a *baoli* and well repaired; 2 latrines for men and 2 for women built; pavings of a street in progress; 2 roads, 3 bridges and pavings of 2 streets repaired, and pavings of a street finished.

Narot.—A well repaired, 2 protective walls and 2 bridges built, and 2 bridges repaired.

Sujanpur.—A well repaired, road from Sujanpur to Sugar-works in progress.

Shahpur.—A well repaired.

Sukhochak.—Steps of a tank and a well repaired; paving of a street repaired.

Ghasitpur village.—Stagnant pools filled in.

Magar Modian village.—All manure heaps removed, and orders issued in regard to blind wells.

Naushera village.—Lambardárs have been ordered to put *kattaras* and copings to wells, and to fill in hollows.

Dera Nának.—One large and 2 small streets paved.

Srígovindpur.—One street paved and one repaired.

Dirman.—One street paved.

Latrines.—The number of public latrines in working order was 12, viz.—Gurdáspur 2, Batála 8, Dera Nának 1, and Fatahgarh 1. The dry-earth system is in force, and the refuse is taken to manure godowns.

The income derived from the sale of manure in each of the Municipal towns of this district during the past two years was :—

	1881.	1882.
Gurdáspur ...	Rs. 493 0 0	Rs. 612 0 0
Dínanagar ...	" 197 0 0	" 161 0 0
Kalánaur ...	" 243 0 0	" 228 0 0
Bahrámpur ...	" 75 0 0	" 56 0 0
Patháankot ...	" 230 0 0	" 462 0 0
Sujánpur ...	" 112 0 0	" 81 0 0
Shahpur ...	" 7 8 0	" ...
Narot ...	" 136 0 0	" 92 0 0
Batála ...	" 576 0 0	" 690 0 0
Dera Nának ...	" 507 0 0	" 679 0 0
Srígovindpur ...	" 48 0 0	" 56 0 0
Fatahgarh ...	" 213 0 0	" 211 0 0
Sukhochak ...	" 27 0 0	" 51 0 0
Kot-naina ...	" 74 0 0	" 204 0 0
Dirman ...	...	...
Total Rs.	2,938 0 0	Rs. 3,583 0 0

SIÁLKOT.

Drainage.—A new packa drain was made in Mianapura, a suburb of the city of Siálkot, and all existing drains and sewers were kept in repair. A packa drain was also in progress at the end of the year in the Fort at Siálkot.

Fourteen new pavements were laid down in the town of Siálkot, and existing ones repaired.

In the following minor towns some new pavements were constructed and some repaired at a cost of Rs. 1,474, viz :—Daskah, Rs. 371; Zafarwal, Rs. 300; Sankhatra, Rs. 250; and Narowal, Rs. 553.

Water-supply.—The wells in the city were cleaned out and repaired, and drains made where necessary to carry off refuse water in Siálkot, and a well in the town of Pasrúr was repaired and cleaned out. A large and important work was in progress at Siálkot at the end of the year which, when finished, will be useful to the inhabitants of the town and to travellers from Jammu, namely, the conversion of the large katcha tank known as “Moulawala” into a fine packa one. It is situated at the North-East corner of the city, at the junction of the city with the Jammu and cantonment roads, and will cost Rs. 12,000.

Latrines.—A new latrine was in course of completion at Pura Heran, on the East of the city during the year. At Siálkot 13 latrines are in good working order, and one female latrine at Nárowál.

There has been a change in the system of disposing of the city refuse and night-soil. It is sold by public auction and removed from the godowns by the contractors. Seven selected sites have been provided for collecting the filth of the city. The income from this source is increasing annually. The same system prevails in all the other minor towns.

The income derived from the sale of manure in the Municipal towns during the past two years is detailed below :—

		1881-82.		1882-83.
Siálkot	...	Rs. 2,411 0 0		Rs. 4,062 0 0
Kila Sobha Singh	...	” 93 0 0		” 110 0 0
Nárowál	...	” 400 0 0		” 400 0 0
Zaffarwál	...	” 265 0 0		” 425 0 0
Sankhatra	...	” 147 0 0		” 147 0 0
Daska	...	” 70 0 0		” 70 4 0
Jámki	...	” 69 0 0		” 91 0 0
Mitránwáli	...	” 81 0 0		” 126 0 0
Pasrúr	...	” 65 0 0		” 70 0 0
Total Rs.		3,601 0 0		Rs. 5,501 4 0

LAHORE.

Metalling city roads and bázárs.

Do. Mooltan road within Municipal limits.

Planting trees on civil station roads.

Culverts for irrigating garden near Chief Court.

Retaining wall at Gazanfar Chauk garden.

Extension of main sewer at Masti gate.

Repavements of streets where water pipes have been laid.

Designs and estimates are under preparation for new slaughter-houses.

The following important works were executed at minor towns :—Metalling junction between town of Kasúr and Raiwind road. Paving streets at Kots Rukndin and Azim Khan at Kasúr.

Remetalling Khemkarn road.

Packa slaughter house at Patti.

Additions to the slaughter-house at Kasúr.

Preservation of existing roads and drains in repair.

Drainage.—The drainage works of the City of Lahore, which were reported as having been commenced in 1881, were completed during the year under report, with the exception of the intercepting sewer, which is now nearing completion. The metalling of the city roads and the construction of new gutters have considerably improved the sanitary condition of the town sewage and storm-waters find an easy exit. The improvement of mohalla drainage has the Committee's attention and when this is properly done and connected with the main system, little room will be left for improvement. In minor towns existing drains were repaired only.

Water-supply.—No additions have been made to the Lahore Water-works' system. The quality of the water continues to be favourably reported on by the Chemical Examiner. The intermittent supply accounts for some slight impurities detected. The design for the new reservoir has been sanctioned and arrangements for construction are in progress. There were 87 house connections made during the year. Caste prejudice, it is stated, still stands in the way of a general consumption by Hindus of pipe water, though, this I did believe and know, as a fact, many use it surreptitiously. The rates for water were reduced during the year. The chief obstacle to increase house connection is, of course, the want of a constant supply. House-holders find it convenient to go to the stand-posts so long as the supply is only by day. As regards minor towns the water is chiefly derived from wells and is pure, and therefore, good for drinking purposes. Where there are tanks and canals, the people resort to them, but chiefly for washing and bathing purposes.

Conservancy.—The contract system for removal and disposal of night-soil of Lahore City and suburbs, is still in force. The present contract will terminate on the 31st March 1884. There has been considerable improvements effected in the sanitary condition of the station and city. Surface cleanliness in minor towns was well attended to by those in authority.

Latrines.—There are 39 public latrines, all in working order, as per detail below:—Lahore 21, Kasúr 9, Khemkarn 4, Pattí 3, Chúníán 1, and Khudián 1. The dry-earth system is reported to be carried out. The refuse is removed regularly in carts, and used for manuring fields. Two new public latrines were constructed this year at Kasúr. The income derived from the sale of manure during the past two years is as follows:—

Lahore	...	...	...	...	Rs.	5,213	10	10
Kasúr	...	...	...	...	"	1,450	0	0
Sharakpur	...	...	...	...	"	551	5	0
Khudián	...	...	...	...	"	46	0	0
Pattí	...	...	...	...	"	30	0	0
Khemkarn	...	...	...	...	"	206	6	3

The income from sale of manure at Lahore will increase largely, as soon as the contractor's lease runs out in March 1884. The income at the small towns fluctuates according to the vested rights of the zamindars in the filth.

GUJRANWALA.

In Gujranwála Rs. 1,968 were spent on metalling roads, and Rs. 807 on improving town streets. Rs. 915 on paving a lane in Katrá Desa Singh, and Rs. 429 on lane Lehna Singh.

In Wazirabad Rs. 1,628 were spent on metalling bázár from Balochi to Morigati, and Rs. 1,355 on bázár from Mori to Samman Burj. A drain costing Rs. 1,196 was constructed, it is connected with the Palku stream and will carry off the sewage of the town. All necessary repairs were executed to pavements, drains and latrines during the year.

Water-supply.—No new works were undertaken in regard to water-supply as the existing supply is pure and wholesome. The village sites are improved by repairing circular roads in places where they had been partially obliterated by removal of dung-heaps to fixed sites and by filling up small hollows.

Latrines.—The number of public latrines in working order during the year were 14, viz. :—Gujranwála 4, Wazirabad 4, Akálgarh 2, Eminabad 2, Pindi Bhattián 1, and Hafizabad 1. The refuse is removed on donkeys and carts to the fields and godowns.

The income derived from the sale of manure in the Municipal towns of the district during the past two years is shewn below:—

Gujranwála	...	...	...	...	Rs.	1,930		
Wazirabad	...	...	...	...	"	642		
Hafizabad	...	...	...	...	"	8		
Pindi Bhattián	...	...	...	...	"	11		
Jalálpur	...	...	...	...	"	6		
Sodrah	...	...	...	...	"	206		
Killa Didár Singh	...	...	...	...	"	35		
Rámnagar	...	...	...	...	"	215		
Akálgarh	...	...	...	...	"	157		
Eminabad	...	...	...	...	"	88		
Total Rs.						3,298		

FEROZEPORE.

The sanitary works executed during the year are as follow, namely:—

Katcha pavement of Fatahkhawala in Ferozepore City,	Rs.	13	14	0
Do. do. Bassao Mal do.	"	127	12	0
Do. do. Bawa Moti Ram do.	"	166	8	0
Do. do. Harnam Das do.	"	248	2	0
Do. do. Dhaunawala do.	"	113	0	0
Pavement of 2 streets at Muktsar	"	658	1	0
Repairs to paved streets at Dharmkót	"	115	0	0
Do. do. Zíra	"	150	0	0
Pavements in bázárs at Makhu	"	999	12	0
Cleaning wells at Ferozepore	"	35	10	0
Do. Zíra	"	70	0	0
Do. Makhú	"	14	4	0

Drainage.—Nearly all the drains of the Municipal towns have been repaired and some new ones constructed, namely:—

Repairs to drains at Ferozepore	...	...	Rs.	251	1	3
New drain at Zíra	...	...	"	200	0	0
Repairs to drains at Zíra	...	...	"	15	0	0
Do. do. Makhú	...	...	"	30	0	0

Water-supply.—Rs. 828 have been expended on the tank at Dharmkót, and the work is making good progress. Want of funds prevents much progress being made in the construction of a tank at Zira.

Conservancy.—A sufficient establishment, as noted below, has been entertained at a cost of Rs. 4,993 :—

				<i>Per mensem.</i>		
				Rs.		
<i>Ferozepore.</i>	1 Head Mate	...	...	10	0	0
	2 Head sweepers	...	...	14	0	0
	1 Do.	...	...	6	0	0
	1 Sweeper	...	...	5	0	0
	77 Sweepers	...	...	308	0	0
<i>Muktsar.</i>	4 Do.	...	...	12	0	0
	1 Chaukidar	...	...	3	8	0
<i>Dharmkót.</i>	4 Sweepers	...	...	12	0	0
	1 Chaukidar	...	...	5	0	0
<i>Zira.</i>	5 Sweepers	...	...	15	0	0
	1 Chaprasi	...	...	5	0	0
<i>Makhu.</i>	1 Sweeper	...	...	3	0	0
	1 Chaukidar	...	...	3	0	0
<i>Moga.</i>	4 Sweepers	...	...	12	0	0
	1 Chaprasi	...	...	5	0	0
<i>Badhni.</i>	1 Sweeper	...	...	3	0	0
<i>Mudki.</i>	2 Sweepers	...	...	6	0	0

Latrines.—There are 7 packa and 7 katcha latrines in working order within the limits of the Ferozepore Municipality. The refuse is sold. Rs. 1,612 have been derived from the sale proceeds of town sweepings in Ferozepore during the past 2 years.

RAWALPINDI.

Drainage.—No new drainage works were undertaken in any of the Municipalities.

Rawalpindi Municipality.—The large drain for carrying off the drainage from the city to the Leh river was effectually repaired at a cost of Rs. 1,100.

Water-supply.—In the Municipality of Rawalpindi all the wells were cleaned and repaired at a cost of Rs. 700. The plan and estimate of the general scheme for the water-supply of this city have not as yet been sanctioned. The work is under the supervision of Public Works Department Officers. The experimental wells connected with this project are in progress, for which Rs. 2,700 was disbursed during the year.

Conservancy.—A total expenditure of Rs. 6,780 was expended for the repairs to drains and pavements in the following Municipal towns, namely :—Rawalpindi, Rs. 1,200 ; Hazro, Rs. 4,500 ; Pindigheb, Rs. 930 ; and Attock, Rs. 150.

Latrines.—The number of public latrines in working order during the year was as follows :—Rawalpindi 26, Attock 1, Hazro 2, and Mokhad 2. The filth is sold in all the Municipalities except in Mokhad.

The following amounts were realised from the sale of manure during the last two years :—

Rawalpindi	...	...	Rs.	130	0	0
Attock	...	...	"	19	8	0
Hazro	...	...	"	138	0	0
Pindigheb	...	...	"	12	0	0
Total Rs.				299	8	0

JHELUM.

Drainage.—Four new drains were opened during the year in the town of Jhelum.

Water-supply.—The water-supply in the district from wells is good and plentiful. All tanks and wells were kept clean. A new well was constructed in the town of Jhelum, at a cost of Rs. 221.

Conservancy.—The conservancy in Municipal towns was satisfactory. The establishment at Jhelum consists of, namely, 1 Darogah, 2 Jamadars, 57 male and 11 female sweepers, and 2 coolies for watering carts. A Darogah was also appointed during the year by the Pind Dádan Khán Municipality for supervision of the conservancy of that town. One new latrine was constructed in each of the Jhelum and Pind Dádan Khán towns.

Latrines.—The number of public latrines in working order are as follow :—Jhelum 6, Pind Dádan Khán 8, Chakwál 2 and Talagang 2. The system of disposing of refuse remains unaltered. The only Municipalities in which any income from the sale of manure was derived were Pind Dádan Khán and Chakwál, namely, Rs. 103 in the former, and Rs. 63 in the latter.

GUJRAT.

Drainage.—During the past year a few new pavements and drains were constructed in the town of Gujrat; some drains were also repaired, and Rs. 96 were spent in repairing and cleaning out wells. The income derived from the sale of manure was Rs. 153-4-0.

Jalálpur.—In this town a few new drains were constructed during the year, and Rs. 93 were spent in repairing and cleaning out wells.

Dingah.—In this town Rs. 29 were spent in cleaning and repairing wells. There are in all 14 public latrines in working order in the four Municipal towns of this district. The refuse is taken to spots set apart for the purpose and buried. It is sold to agriculturists for manuring purposes.

SHAHPUR.

Drainage.—No new drains or sewers were constructed in any town in this district, but the existing ones were kept in excellent working order and thorough repair. The total expenditure incurred for this work during the year was Rs. 168, namely, Bhera, Rs. 37; Miáni, Rs. 72; Sahiwál, Rs. 35; Khushab, Rs. 24.

Water-supply.—The tanks and wells in all the Municipalities were thoroughly cleaned out and repaired at an outlay of Rs. 450, viz; Bhera, Rs. 6; Miáni, Rs. 135; Sahiwál, Rs. 176; Khushab, Rs. 123; Girot, Rs. 10. A new well for drinking purposes was constructed at the Civil Station of Shahpur at the expense of the District Committee, and another was in progress at Nowshera in Tahsil Khushab. The construction of another new well has also been undertaken by the Khushab Municipality.

Streets.—Streets and roads were kept in good repair, and small gaps and bridges were constructed in several towns where water accumulated during the rains.

Conservancy.—During the year under report the several conservancy establishments cost Rs. 6,198. In some of the chief villages, some sweepers were also entertained and paid out of the village funds. Fixed sites have been selected at proper distances from towns, where refuse and sweepings are thrown, and the people have been prohibited from easing themselves in open grounds.

Latrines.—There are 25 public latrines in working order in the several Municipal towns. The refuse is sold to contractors at Bhera, Khushab and Girot; but it is buried under ground at the towns of Sahiwál, Shahpur and Miáni.

The income derived from the sale of manure in 1881 was Rs. 216, and in 1882 Rs. 200.

MOOLTAN.

Streets and pavements.—During the year one street and 5 by-lanes were paved at a cost of Rs. 5,073 in the Mooltan City, and Rs. 1,676 were expended on repairs of street pavements. The bazar at Shujábad leading to the Mooltan Gate was paved on the convex pattern with drains on either side at a cost of Rs. 919. Three lanes at Jalálpur were paved at a total cost of Rs. 1,717. Of this amount Rs. 900 were spent in 1881, and Rs. 817 in the year under report, when the work was completed. These were also constructed on the same pattern as at Shujábad.

Water-supply.—Two wells at Kahrór were repaired at a cost of Rs. 126, and 2 at Jalálpur at Rs. 240. The *Kup* drain in the centre of the city, which has always been pointed out to be very defective owing to its depressions in the matter of conveying the sewage of a large part of the city, has received the attention of the Committee, and its defects will soon be remedied by the levels that have been taken.

Conservancy.—For a part of the year the same system of conservancy was in force in the Mooltan Municipality as was previously; but from the month of July it was so far modified by a resolution of a general meeting of the Committee that street sweepings of all sorts, including horse-litter, were no longer allowed to be carried away by the zamindars' bullocks to their fields, but were taken over by the Committee and removed by them along with the night-soil through their paid bullock agency, which had to be augmented, to the selected sites outside the city. Two new sites have been selected, in addition to the three that were in existence before, for the convenience of the zamindars, who clamoured long for an exemption in favor of street sweeping. The plan of having enclosures, where night soil and refuse matter of all kinds might be thrown in together, has not yet been tried. The system of burying in trenches is still carried on to ensure deodorization, though an experiment on a small scale will be tried on the enclosure plan to see if deodorization is as quickly, and as fully, obtained as in the trench system.

Latrines.—Besides the above-mentioned works 19 latrines were repaired in the Mooltan Municipality at a cost of Rs. 183, and 6 latrines were built at Jalálpur at Rs. 231. Of the wells in the City of Mooltan, 432 were thoroughly cleaned out during the year at a cost of Rs. 413. Rs. 32 were also spent at Shujábad on the cleaning out of wells. A large hollow outside the town of Shujábad, where rain-water used to collect, was converted into a fine packa tank at a cost of Rs. 2,324. It will be supplied with water from the canal during the summer months and will be a great boon to the people of the place.

The income from the sale of manure during the six months that the scheme has been working has been Rs. 540 against Rs. 200 derived from the same source during the year 1881, and Rs. 214 in 1880. There are 29 public latrines in working order in the Mooltan City, of which 4 are roofed.

JHANG.

Drainage.—Six drains were constructed at Jhang-cum Maghiána at a cost of Rs. 786-12-4, and those already in existence at the above towns and at Chiniot have been repaired at an outlay of Rs. 579-3-7. One main drain at Maghiána has been carried out to the nalla, which drains the town, and another is in progress. Both are made in saucer-shape. The nalla, draining Jhang, has been properly levelled, so that there are no longer standing pools.

Water-supply.—The water-supply is extremely good. The wells fed by the Chenab, filtered through some miles of sand, could hardly be better if they were protected from dirt. A number of wells at all the four Municipal towns and at some of the villages have been cleaned at the expense of their owners.

Conservancy.—In the Jhang-cum Maghiána Municipal town Rs. 243-12-0 have been expended on the completion of new latrines. Rs. 70-4-8 have been laid out on the repairs of three latrines at Maghiána. Boundary pillars have been erected round the town of Chiniot, beyond which all the inhabitants have to go to ease themselves. The *badarrohs*, from private houses into the streets at Chiniot, have been ordered to be closed. The cattle stalls in the public streets have also been removed. A good deal of improvement has taken place in the way of filling up hollows, establishing manure godowns, &c.

Latrines.—The number of public latrines in working order during the year are 22, *viz.*, Jhang-cum Maghiána 18, and Shorkot 4. No latrines can be made at Ahmadpur as they would be subject to periodical inundations. Four katcha latrines are required at Chiniot—all will be made. Several spots have been selected at reasonable distances from the Municipal towns where refuse is collected.

The income derived from the sale of manure is shewn thus:—

	1880.	1881.	1882.
Jhang-cum Maghiána	... 542	963	720
Chiniot	... 257	271	230
Shorkot	... 17	38	44
Ahmadpur	... 30	61	68

MONTGOMERY.

The following works were executed during the year:—

<i>Montgomery.</i> —Repairs to wells	...	...	...	Rs. 71
Do. to latrines	...	...	...	„ 45
<i>Kamalia.</i> —Repairs to latrines	...	...	...	„ 3
<i>Pákpattan.</i> —Construction of drainage	...	...	...	„ 157
Repairs to wells	...	...	...	„ 44
Pavement of streets	...	...	...	„ 495
Construction of latrines	...	...	...	„ 39
Repairs to latrines	...	...	...	„ 82

Drainage.—The principal streets of all Municipalities have packa drains on both sides, through which filthy water, rain, &c., passes out into excavations provided for their reception. Where there are no excavations, the water passes into the open, some distance away from the town. During the year the drains of Montgomery have been cleaned, and a new drain has been constructed at Pákpattan.

Water-supply.—Water is obtained from wells and is considered to be good.

Conservancy.—Sweepers are appointed in every town to clean streets and drains, &c., under the supervision of the members of the Municipal Committee.

Latrines.—There are altogether 27 latrines in working order as detailed below:—Montgomery 3, Pákpattan 10, Kamália 7, Sayadwála 4, and Dipálpur 3. Sweepers are appointed in each town to sweep and carry out refuse. At Kamália and Sayadwála the refuse is sold by auction to the highest bidder, and at Montgomery and Dipálpur it is buried in trenches, 2 feet deep, and covered over with earth. At Pákpattan it is used for burning bricks.

The income derived from the sale of manure during the past two years is as follows:—

Kamália	...	...	...	Rs. 860
Sayadwála	...	...	...	„ 78
Dipálpur	...	...	...	„ 30
Total	...	...	...	968

MUZAFFARGARH.

No large sanitary works were undertaken during the year, but, as far as funds were available, drains were extended and repaired, wells were cleaned out and repaired, manure godowns and privies

were built and repaired, streets were paved and other like improvements made. A brief account of each is given as follows :—

Drainage.—The Rohilawali drain referred to in last year's report is in progress. During the spring of 1882 it was levelled for the first time above the Panjihar bridge and cleared out to regular slopes. As there was not sufficient labour to improve the outfall, its improvement will be taken in hand during the spring of 1883.

Side drains in the street pavements were extended and repaired in the following towns at a total cost of Rs. 471-13-0, *viz.*, Alipur, Rs. 425-13-0 ; Muzaffargarh, Rs. 26 ; Khangarh, Rs. 20.

Water-supply.—Some of the wells in the towns were provided with parapets and waste water conduits, and nearly all the wells in the Municipalities were cleaned out and repaired at a cost of Rs. 1,255.

Conservancy.—The system of manure godowns introduced in the beginning of 1881 was established in all the Municipalities and worked throughout the year. In six Municipalities the storing grounds which had not been enclosed were provided with enclosure walls at a cost of Rs. 108-9-8. Under the new arrangement the town sweepings, night-soil, &c., are removed every morning instead of being heaped in the streets.

Streets.—Eight streets were paved in the following towns at an outlay of Rs. 1,432, namely, Khangarh, Rs. 932 ; Alipur, Rs. 253 ; Shahr Sultan, Rs. 164 ; Khairpur, Rs. 16 ; and Sitpur, Rs. 67. A portion of the Muzaffargarh circular road was also metalled, and portions of the unmetalled roads were raised. A portion of the street in Alipur was widened.

Latrines.—There are 18 latrines in working order in the following towns, *viz.*, 2 in Muzaffargarh, 2 in Khangarh, 4 in Kingar, 2 in Alipur, 2 in Shahr Sultan, 3 in Jatoi, and 4 in Khairpur. Besides these, privies were built in the following towns, at a total cost of Rs. 530-8-0, *viz.*, Kingar, Rs. 134 ; Muzaffargarh, Rs. 57 ; Shahr Sultan, Rs. 48 ; and Khangarh, Rs. 291-8-0.

The following table shews the *income* derived from the sale of manure, and the *expenditure* of the conservancy establishment in the 10 Municipal towns of the Muzaffargarh District from 1879 to 1882 :—

No.	Municipalities.	INCOME.								EXPENDITURE.							
		1879.		1880.		1881.		1882.		1879.		1880.		1881.		1882.	
1	Muzaffargarh ...	76	0 0	66	0 0	99	0 0	154	10 0	...	...	854	0 0	1,030	0 0	1,077	8 3
2	Khangarh ...	17	0 0	13	8 0	342	0 0	478	0 0	...	...	385	0 0	603	0 0	746	13 3
3	Kingar ...	...	...	...	...	...	...	35	2 0	...	...	...	...	29	0 0	193	0 0
4	Shahr Sultan ...	11	0 0	7	0 0	2	0 0	10	8 0	...	...	134	0 0	203	0 0	229	1 3
5	Alipur ...	64	0 0	67	0 0	149	0 0	131	15 5	...	...	551	0 0	801	0 0	830	11 1
6	Jatoi ...	26	0 0	27	0 0	7	0 0	53	8 0	...	...	108	0 0	245	0 0	342	7 9
7	Khairpur ...	10	0 0	8	0 0	1	0 0	7	0 0	...	...	350	0 0	588	0 0	621	0 0
8	Sitpur ...	118	0 0	109	0 0	39	2 0	102	2 0	...	...	230	0 0	294	0 0	303	12 2
9	Kot Adu ...	...	...	...	...	...	...	5	0 0	...	...	...	...	84	0 0	248	12 1
10	Dairadin Panah ...	...	...	...	...	...	...	83	0 0	...	...	...	...	72	0 0	161	8 0
Total ...		322	0 0	297	8 0	639	2 0	1,060	13 5	...	...	2,612	0 0	3,949	0 0	4,754	11 10

DERA ISMAIL KHAN.

Drainage.—A number of holes and depressions in Dera Ismail Khan and in some of the frontier villages have been filled up.

Good progress has been made in substituting masonry for katcha drains in the chief bazárs of Dera Ismail Khan, Bhakkar, Leiah, Karor and Kulachi.

Water-supply.—Wells, tanks, hill torrents and the river Indus are chief sources of potable water. The water is good and plentiful. The wells in Municipalities have been cleaned out and kept in good order.

Conservancy.—There were six conservancy carts in use at the close of last year, and one new cart has since been added, making a total of seven carts. These carts were employed to carry out night-soil, urine and street sweepings. The night-soil is taken to the intra-mural godowns from whence it is removed to extra-mural ones situated at a distance from the town.

Latrines.—The number of public latrines is the same as in the previous year, namely, 20. They are kept clean. The refuse is sold as manure. The “ khad ” godown system is in force in all the Municipal towns.

The income derived from the sale of manure was Rs. 1,159 in 1881 and Rs. 952 in 1882.

DERA GHÁZI KHAN.

Drainage.—Rs. 1,297 were expended on the construction of new drains in this district as follows :—

Dera Gházi Khan Municipality	...	...	...	Rs. 874
Jampur	do.	...	...	„ 423

On repairs of drains Rs. 560 were expended as follows :—

Dera Gházi Khan Municipality	...	...	...	Rs. 415
Jampur	do.	...	...	„ 48
Dájal-cum-Nowshera	do.	...	...	„ 79
Rájanpur	do.	...	...	„ 18

Water-supply.—The only expenditure incurred in connection with water-supply was the sum of Rs. 700 expended by the Dájal Municipality in repairing and improving the water channel that brings down hill stream water from Harrand to the Dájal city.

Conservancy.—The conservancy arrangements consisted of cleaning out city wells, carrying off the sewage of the city by a net work of drains, which were kept scrupulously clean, having latrines kept clean and sprinkled with dry earth, &c.

The number of public latrines in working order during the year were :—Dera Gházi Khan Municipality 12, Dájal-cum-Nowshera 4, Jampur 8, Rájanpur 6, and Mithankot 4.

City refuse is carried away by zamindars who pay Rs. 1-8-0 half-yearly for the privilege of one bullock carrying away daily as much refuse as it can. The “ khad ” godown system was adopted in the Dera Gházi Khan Municipality two years back, but the arrangement was opposed by the members of the Committee and by the principal zamindars interested in obtaining manure. Major Tucker, the then Officiating Deputy Commissioner, discontinued it and allowed a revival of the old system which is now in force.

Rs. 1,341-1-6 were derived from the sale of manure during the past two years, as per detail below :—

Dera Gházi Khan Municipality	...	...	...	...	Rs. 609	9	6
Dájal-cum-Nowshera	do.	...	...	...	„ 200	0	0
Jampur	do.	...	...	...	„ 372	12	0
Rájanpur	do.	...	...	...	„ 139	0	0
Mithankot	do.	...	...	...	„ 19	12	0

BANNU.

Edwardesabad.—The pavement of the street from the Hawaid Bazár to the Lakki Bazár has been completed, and that from the Mirián Bazár to the northern wall of the city is in progress. One noticeable sanitary improvement is the construction of sweepers' houses, which are nearly completed. The existing sanitary works were kept in good repair in all the Municipal towns except at Isa Khel, where the main drain requires relaying. A packa masonry *band* at Kalabagh over which rain water from the hills drains has been improved. A packa drain on one side of the pavement from the Akbari Gate to the Daurian Gate has been improved, and another in one of the lanes adjoining the same street has been newly constructed. The sinking of a third well is in progress, which will be furnished with a Persian wheel like that on the Mandi well to ensure an easy supply of water to the public.

No sanitary works have been executed, nor are any in progress, in the outlying Municipal towns of Lakki, Isa Khel and Kalabagh. The former two have no funds at their disposal for such works.

Conservancy.—A sufficient establishment is employed for each Municipal town, which, as a rule, is kept clean. At Edwardesabad one of the 7 urinals has been closed and another constructed in its stead, outside the Mirian Gate, where it was especially needed. A new latrine has been constructed at Kalabagh in place of the one that fell down.

There are 12 latrines in working order, namely, 4 at Edwardesabad, 4 at Isa Khel, and 4 at Kalabagh. The refuse is removed daily and buried in ditches three feet deep, and afterwards covered with earth. It is dug out at the end of the year and sold as manure to the zamindars.

The income derived from the sale of manure at Edwardesabad and Kalabagh is shown as follows :—

	1880.	1881.
Edwardesabad	Rs. 777	Rs. 1,027
Kalabagh	...	„ 2

PESHAWAR.

Drainage.—Saucer drains were laid down in the following streets during the year :—Mohalla Baru, Nakeban, Mackeson Mandi, Pushtchabutra, Kamachpuzan, Chirwa Khoi, Chauk Nasu Khan, Borehafan, Rasiwatan Gandiwera, Duma Guli, Gradi Khana and Yokatut. Minor works were also executed in many other places. For the masonry surface openings in covered drains grated windows have been provided.

Water-supply.—The city canal has been completed up to the City Kotwali, and the people use the water therefrom for drinking purposes ; the remaining portion is in progress, and it is hoped will be finished this summer, when the residents of that part of the city will obtain water for drinking purposes near at hand. The Committee has made a very good well in Ganj, and its water is said to be of good quality.

Conservancy.—There are six sets of latrines in the city which are worked well. Fresh iron pipes have been supplied when necessary, and the latrines have been repaired and cleaned out regularly. Two sets of new latrines were constructed at Mohalla Katchi and Barez Khan. The conservancy arrangements in force are the same as last year, and the same attention was paid to their proper working. An Assistant Darogah was appointed for each sub-division of the city, but they did not give satisfaction and have consequently been dismissed. Improved carts for carriage of refuse have been provided with better cattle for drawing them.

The following was the income derived from the sale proceeds of manure during the two past years :—

1881	...	...	...	Rs. 2,655
1882	...	...	...	„ 2,788

HAZARA.

The principal works executed were : Completion of drainage works at Haripur and Buffa. All wells were cleaned as usual and the supply of water from wells and springs was normal.

A water-supply scheme for Abbottabad from the Deri stream is under contemplation in the Public Works Department.

The income derived from the sale of manure at Abbottabad was Rs. 21.

KOHAT.

The following drains were constructed :—

Drain underneath main bazár	...	...	...	Rs. 2,444
Ditto from Shakardand to Mian Khel Gate,	...	...	...	„ 1,833
Ditto through Shakardand pool,	...	...	...	„ 440
Side drain Mian Khel ward,	...	...	...	„ 997
Drain from Tahsíl to Teli lane,	...	...	...	„ 446

Twelve urinals were completed during the year at different sites in the town at a cost of Rs. 141.

There were three public latrines in working order.

The refuse is buried in trenches outside and to the south of the city in a direction opposed to the prevailing winds.

The income derived from the sale of manure during the two past years was Rs. 520, viz., Rs. 120 in 1881 and Rs. 400 in 1882.

SECTION X.—GENERAL REMARKS AND PERSONAL PROCEEDINGS.

52. The charge of the office of Sanitary Commissioner, Punjab, was held by me throughout the year under review, and that of the offices of Deputy Sanitary Commissioner, Eastern and Western Circles, by Surgeon J. O'Neill, M. D., and Surgeon B. Doyle, M. B., respectively, both of whom have carried on their duties with zeal and ability.

53. In addition to the duties of my own office, I was engaged in the preparation of the History of Cholera in India, required by the Cholera Committee, appointed in October 1881, under the orders of the Government of India. A copy of this History, from 1862 to 1881, with a General Statistical Summary, and deductions drawn therefrom, was laid in a printed form before the Committee on the 9th January 1883, and forwarded to the Secretary to the Government of India on the 17th of that month. Detailed Histories of Cholera with statistical summaries have also been prepared separately for each of the different Provinces in India; but all these, however, could not, for want of time, be printed for the use of the Committee. On the 3rd of December 1882, I went to inspect the city of Amritsar, a report of which will be found further on. On my return from that place, I proceeded, under the orders of Government, to Jhang, to investigate the causes of the fevers prevalent in that district, and to suggest remedies for the prevention and mitigation of its ravages. From Jhang, I went to Dera Ismail Khan, a district which also suffered very severely from fevers. My report on the result of my investigations in Jhang are given in Section VI.—Chief Diseases, under the head C. Fevers. From the 23rd January to the 6th March, I was under canvas, inspecting the towns and villages in the districts of Lahore, Gujranwála, Siálkot, Jhelum and Shahpur.

54. In the Memorandum by the Army Sanitary Commission on the Punjab Sanitary Report for 1880, no special suggestions appear to have been made. In the concluding portion of paragraph 18 thereof, however, the Commission remarks, in reference to the Dialogue printed in my Annual Sanitary Report for 1879, that “the practical question suggested by the whole discussion is simply how to bring authority to bear on local sanitary improvement (which nevertheless must to a large extent be done by the people themselves) so as to keep them up to the work.” On this subject I should state that the Dialogue has not only been translated into the vernacular, under the orders of the Punjab Government, in the office of the Director of Public Instruction, but that it has also attracted the attention of the local vernacular newspapers and others. The Editor of the *Takmil-il-Hikmat*, a paper which is widely circulated all over the country, has made a translation of it in his journal. The Sanitary Commissioner of the Southern Deccan, Belgaum, has applied for a copy, and I have received an application from one Aya Singh, Inspector of Police, Lahore Central Office, to be allowed to translate the same into Punjabi. Fifty thousand copies of the Dialogue have been printed off, and will now be supplied to all the districts of the Province at 1 anna per copy.

55. During the year under review, 80 towns and 178 villages were inspected by the several Civil Surgeons in the course of their tours of inspection. The number of towns and villages inspected by the localities visited is given in the following table:—

Number.	DISTRICTS.						By whom inspected.	Number of towns inspected.	Number of villages inspected.	Total.
1	Delhi	...	...	...	...	...	Surgeon-Major G. C. Ross, Civil Surgeon	2	...	2
2	Gurgáon	...	...	...	...	...	Assistant Surgeon Gokal Chand	3	1	4
							Hony. Surgeon R. E. Wrafter, Civil Surgeon	1	1	2
3	Karnál	...	...	...	...	...	Surgeon G. W. P. Dennys, Civil Surgeon	4	3	7
							Assistant Surgeon Bhagwan Das	...	8	8
4	Hissár	...	...	...	...	...	.....	...	...	...
5	Rohitak	...	...	...	...	...	.....	...	...	...
6	Sirsa	...	...	...	...	...	Apothecary R. Crossley, Civil Surgeon	3	8	11
7	Umballa	...	...	...	...	...	Surgeon-Major G. Thomson, Do.	...	1	1
							A. E. R. Stephens, Officiating Do.	10	1	11
8	Ludhiána	...	...	...	...	...	.....	...	...	...
9	Sinla	...	...	...	...	...	.....	...	...	...
10	Jullundur	...	...	...	...	...	.....	...	...	...
11	Hoshiárpur	...	...	...	...	...	Hony. Surgeon C. L. Fox, Civil Surgeon	15	5	20
12	Kángra	...	...	...	...	...	.....	...	...	...
13	Amritsar	...	...	...	...	...	Surgeon J. Duke, Civil Surgeon	3	...	3
14	Gurdáspur	...	...	...	...	...	Assistant Surgeon Bhagwan Das	...	4	4
15	Siálkot	...	...	...	...	...	Do. Do. Sodhi Fattah Singh	3	13	16
							Do. Do. Gokal Chand	4	9	13
16	Lahore	...	...	...	...	...	Do. Do. Ram Kishen	1	18	19

Number.	DISTRICTS.					By whom inspected.	Number of towns inspected.	Number of villages inspected.	Total.
17	Gujránwála	...	...	...	...	Hony. Surg. Major R. J. Quinnell, M. D., Civil Surgeon	4	10	14
18	Ferozepore	...	...	...	...	Assistant Surgeon Malik Jowala Sahai	...	2	2
19	Ráwalpindi	...	...	...	...	Do. do. Fattah Chand	2	3	5
20	Jhelum	...	...	...	...	...	...	...	...
21	Gujrát	...	...	...	...	Hony. Surgeon-Major J. R. Deane, Civil Surg.	6	40	46
22	Shahpur	...	...	...	...	Surgeon G. F. Nicholson, Do.	3	21	24
23	Mooltan	...	...	...	...	Assistant Surgeon Radha Kishen	3	4	7
24	Jhang	...	...	...	...	Surgeon-Major R. Gray, M. B., Civil Surgeon,	1	...	1
25	Montgomery	...	...	...	...	Assistant Surgeon Chetan Shah, Rai Bahadur,	8	21	29
26	Muzaffargarh	...	...	...	...	Hony. Surgeon J. Connor, Civil Surgeon	2	5	7
27	Dera Ismail Khan	...	...	...	...	...	...	...	...
28	Dera Gházi Khan	...	...	...	...	...	...	...	...
29	Bannu	...	...	...	...	...	...	...	...
30	Pesháwar	...	...	...	...	...	...	...	...
31	Hazára	...	...	...	...	...	...	...	...
32	Kohát	...	...	...	...	J. F. B. Bookey, Civil Surgeon	2	...	2
Total						...	80	178	258

56. It is pleasing to me to remark that the officers who took great interest in this work are Civil Surgeons who took an interest in the work of inspection of towns and villages. Surgeon A. E. R. Stephen, late Civil Surgeon of Umballa, Honorary Surgeon C. L. Fox of Hoshiárpur, Honorary Surgeon-Major R. J. Quinnell of Gujránwála, Honorary Surgeon-Major J. R. Deane of Gujrát, and Assistant Surgeon Chetan Shah, Rai Bahadur, of Jhang. No reports were received from the Civil Surgeons of the districts of Rohtak, Kángra, Jhelum, Montgomery, Dera Ismail Khan, Dera Gházi Khan, Bannu, Pesháwar and Hazára. This shows that no inspection was made by these officers. Of course, I am aware that in districts where the medical duties of civil stations are discharged by military officers, in addition to their own legitimate work in Cantonments (as is the case in the last five mentioned districts), towns and villages cannot be easily inspected, but in the other districts there is no such excuse.

57. The vaccinators were employed during the year under report on the duty of inspecting villages within their allotted areas in accordance with the orders conveyed in para. 8 of Punjab Government letter No. 3261, dated 10th September 1881. Brief reports have been received from several districts, and with a few exceptions, the vaccinators appear to have experienced little or no opposition in the discharge of this portion of their duties. A set of rules, however, for the guidance of vaccinators has been drawn out and submitted to Government for orders, and is still under consideration.

58. The following summary, prepared from the annual reports of Civil and Medical officers, shows the manner in which the vaccinators were employed in sanitary work during the non-vaccinating season in each district of the Province. The report furnished by Dr. Dennys, Civil Surgeon of Karnál, is particularly interesting, and reflects very great credit upon that officer's tact and judgment. I would recommend that other Civil Surgeons should also, as far as practicable, follow the plan of work adopted by him in that district:—

Delhi.—Contrary to the orders of Government, the Civil Surgeon, Dr. Ross, did not employ his vaccinators on sanitary work during the summer season.

Gurgáon.—One thousand one hundred and seventy villages were inspected by 9 vaccinators during 3 months and 11 days of the non-vaccinating season. The Municipal towns were not inspected by the vaccinating staff, as they have their own conservancy establishment to look after their sanitary arrangements.

Karnál.—Dr. Dennys' report is as follows:—"About the end of April last year, the vaccinators having all returned from the district to head-quarters, by my order, I determined to draw out a rough scheme for my own use to help me in carrying out the wishes of Government with respect to sanitary work in the district. The outlines of my scheme I communicated to you roughly in this office No. 136, dated 31st May 1882.

Since then I have had some further experience in the matter, and towards the end of the hot season, my vaccinators were all working on one regular system throughout the district, the details of which I beg herewith to append for your information.

The first conclusion I came to was that the work of vaccinators during the hot weather would be comparatively worthless if some regular check could not be held over them, by which I could myself exercise some control over their actions, in the cause of sanitation, and prevent the possibility of any complaints being brought against them by villagers among whom they would have to work, and who of course would naturally be at first opposed to and unwilling to carry out any suggestions made by them. Further, I could see that the lambardars of the villages would not listen in many instances

to any suggestions made by vaccinators, unless they were sure that these suggestions had been before the District Officers and had received their approval. In short, I thought that vaccinators should have no real power whatever, that the results of their inspections of villages and the suggestions they made for improvement of them should be first of all approved of and sanctioned by the Civil Surgeon, and by him the necessary orders for the carrying out of the same should be issued through the proper channels. After having put each vaccinator through a short course, and having convinced myself that each had acquired a fair knowledge of what his duties consisted, I appointed a certain number of them to each of the 3 tahsils of this district. I was new to the district at that time, and it was quite impossible for me to say what particular villages in each tahsil should be the first to be attended to, or which most required sanitary reform; but it seemed obvious to me that with a staff of only 9 vaccinators, a limited number of villages only could be attended to during the hot weather. I asked the Deputy Commissioner, therefore, to send orders to each Tahsildar in the district to give every help in his power to the vaccinators in the work they were about to enter upon, leaving it to them to decide which particular villages in their respective tahsils required attending to first of all. I had, however, suggested that roughly about 20 villages in each tahsil should be fixed upon, and that the vaccinators should visit these in turn, submitting to me at once a report on each—the conservancy arrangements in force, the water-supply, &c., &c.

The vaccinators commenced their work about the beginning of May. They had orders to make out a rough map of every village they inspected and reported upon, which was to accompany the report. In these maps they were to indicate the sites they proposed for deposit of manure, &c., &c., and also the distances that these sites were, from wells, tanks and the village itself; and also indicate any other points which it might be useful for me to know. Many of the vaccinators drew out these maps very neatly and accurately, copying them from the maps in the possession of the Patwari. I was thus enabled to form a very accurate idea of the position of wells and tanks, the size and population of the village, the number of lambardars, and the distances from the village and position of the sites proposed by the vaccinators. I drew out a weekly form or report in vernacular, which I had printed, and also a monthly form which I submitted to the Deputy Sanitary Commissioner, the latter being an epitome of the weekly returns received from each vaccinator during the month, and which, of course, was compiled at my office at Karnal month by month. Copies of these forms were forwarded with this office No. 136 of the 31st May 1882, for your information.

On the receipt of a weekly return with a map, or in some cases 2 or 3 maps of villages, I was enabled to form a fairly accurate idea of what the particular vaccinator proposed doing, and if his suggestions appeared to me to be sound, I attached my initials on the spot or spots indicated on the map. The map was then sent from my office to the Tahsildar in whose tahsil the village happened to be. The Tahsildar then sent out a chaprassi or two, the proposals were explained to the lambardars and headmen of the village, and they were requested to have the suggestions carried out with as little delay as possible. I may mention here that before starting I had explained to my vaccinators how desirable it was that they should work in harmony with the villagers, that the suggestions they made should be, as far as possible, such as not to inconvenience or annoy the lambardars, that in every case where a new site was appointed for any purpose whatsoever, a plot of uncultivated or waste ground should be chosen, so as to interfere as little as possible with the cultivation. In many cases this was found to be quite impossible, there being no waste ground anywhere near the village that would answer the purpose. In such cases I found several of the zamindars were willing, with a little persuasion, to give up a small portion of the land under cultivation for the purpose; but there were cases in which this concession was flatly refused, and I had to make arrangements which were not altogether satisfactory.

It is difficult to credit the amount of opposition that was raised at first to these apparently simple and easily arranged suggestions. In many cases the lambardars and zamindars objected, their reasons being innumerable; then often, when these individuals had agreed, the *chamars* or sweepers of the villages would object, and submit to me a petition begging of me to remove the site to some other spot. The distance from the village was a very common objection, the inclination of all villagers in this district being to deposit all the filth of the village immediately outside the walls. I often found their manure thrown all along the banks of one of their tanks, the water of which was used for drinking; or in other cases the dirt would be heaped up all around one of the principal wells of the village.

The principal points to which I directed the attention of my vaccinators to guide them in their work were—

The appointing of regular sites within a reasonable distance from the village (*viz.*, from 200 to 500 yards, or so) for the deposit of manure and other refuse matter; that these sites should be protected by a small mud wall about 4 feet high, and that they should be so situated as to make the possibility of pollution of the water of wells or tanks in or around the village out of the question; that these sites should be used exclusively for the above purpose, and that no deposits of manure in any other parts be permitted on any consideration; the number of these manure deposits were to be regulated of course by the size of the village, but were not to exceed 4 or 5 at the outside. The protection of water-supply either from wells or tanks. The custom of using the banks of the tanks for purposes of nature to be forbidden; that wells should all be supplied with parapets; that washing of clothes, &c., should not be allowed on the parapets of wells; that the neighbourhood of wells and tanks be kept clean, &c.

The appointing of sites for *chamars* to carry on their work of killing, skinning and cleaning animals, tanning leather, &c. I find that in nearly every village this work is done inside, that the smell on approaching these spots is beyond description, the ground used for the purpose is saturated to a depth of several inches with decomposing blood, urine, &c., and that no attempt is ever made to clean it. The carcasses of dead animals are allowed to rot where they were skinned in many instances, and the place is alive with vultures and village dogs. I think this practice should be put a stop to. *Chamars* should be made to skin and clean their animals at regular appointed sites some distance from the village, and if possible also the tanning should be done outside the village. This I have carried out as far as possible in the villages inspected by the vaccinators during last hot weather. Cleanliness of the streets and drains inside the village, the regular removal of cowdung by the sweepers of the village, &c., and the prevention of acts of nature being performed in or immediately outside the village.

The appointing of sites just outside the village for housing of pigs. These animals are kept in very large numbers in many of the villages, specially in the Karnál Tahsil. They are allowed to wander about all over the village, make a great mess, and are the source of much ill-feeling between the owners and the upper classes, who contend that the water of their sacred tanks is polluted by them and rendered undrinkable. Any other matters which in the opinion of the vaccinators it would be advisable to make suggestions upon.

It will be seen from the accompanying Sanitary Report that, during the last hot weather, there were 60 villages inspected and brought under sanitary improvements in this district. In some of these there was not the smallest difficulty in carrying out the suggestions made, the lambardars taking most kindly to the work, and many even seeming to appreciate it. I regret to say, however, some of these villages are still, notwithstanding all the trouble that has been taken, in a very unsatisfactory condition in a sanitary point of view. I am convinced that, in such cases as these where the villagers will not attend to suggestions made by the Civil Surgeon, nor heed the persuasion of Tahsildars and others, it is worse than useless for the Civil Surgeon to continue the struggle. We are at present powerless to do anything by which we can enforce our suggestions being carried out; and until some power is given to Magistrates to punish by fine or imprisonment the headmen of such villages, the sanitary scheme can never be made to work really satisfactorily. I think even one or two examples made occasionally would have a most wholesome effect on neighbouring villages, where, as no sooner does one village see that in such and such a village the Civil Surgeon's orders have not been carried out and no punishment has followed, then they also adopt the same principles, and in the course of a few years the sanitary work now set on foot must come to a standstill. I think the lambardars should be made responsible for the sanitary condition of their villages, the Civil Surgeon, of course, through his vaccinators, making, from time to time, whatever arrangements he may think advisable; and the lambardars failing to carry out his orders should be fined or otherwise punished.

In many cases where there was any dispute on matters connected with my sanitary suggestions, I myself went out and visited the village, and am glad to say on such occasions I was generally able to come to a distinct understanding with the villagers. I have never yet known them refuse to listen to my suggestions: quite the contrary; but I find often, that a few months afterwards on sending a vaccinator again to that village, he reports they have reverted to their old filthy habits, and the practice of depositing manure, &c., in appointed sites had been abandoned. On the whole, however, I think that a great deal can be done by perseverance; and I am quite certain that a great many of the villages that came under the sanitary work last hot weather are patterns of cleanliness as compared with those that were not inspected by the vaccinators.

I have not found it at all necessary in this district to furnish the vaccinators with anything like an official authority. The villagers seem quite ready to acknowledge them as Government servants, and the vaccinators themselves have never complained to me of disrespect shewn them at the hands of villagers. Out of the 60 villages, there are 3 or 4 that have taken scarcely any steps towards cleaning up their villages; there are several that have not quite done all that I should wish, and many that are now in a sanitary point of view all that could be wished for.

During last hot weather the vaccinators communicated with me direct in the first place, *i.e.*, when they forwarded their weekly returns with the maps. After that I carried on the work through the Tahsildar, with whom I communicated direct. After my propositions had been carefully explained to the lambardars, the Tahsildar made them attach their seals or "Mohars" at the bottom of the map, an agreement was made with them that the suggestion should be carried out within a limited period (generally a fortnight or so), and the map, reports and other correspondence were returned to my office and then filed. In due time the vaccinators revisited the village, reporting to me its condition and how far my suggestions had been attended to.

I am greatly indebted to Major A. S. Roberts, Deputy Commissioner, for the great help he afforded me in carrying out this work, without which it would have been almost impracticable; and thanks are due to him for the help afforded to vaccinators by the Tahsildars and Naib Tahsildars. I hope next hot weather to swell the number of villages under sanitary arrangements to more than double their present number."

Hissar.—Five hundred and sixteen villages were inspected by the vaccinators from May to October. Dr. Cooper furnishes a list of the names of villages visited, the number of births and deaths in *chaukidars'* books, the number of tanks and wells, and the quality of well water in each village. He considers the sanitary work performed by vaccinators "very satisfactory."

Rohtak.—Every town and village in the district was inspected by the vaccinators between 10th April and 10th October.

Sirsa.—Three hundred and forty-three villages and 5 Municipal towns were visited from June to September 1882. The men were distributed in consultation with the Deputy Commissioner, but the Civil Surgeon, Mr. Crossley, "cannot yet say that the slightest benefits have accrued."

Umballa.—Vaccinators were employed in inspecting the sanitary condition of towns and villages from 1st May to the end of October, during which period they visited 2,105 villages in the whole district.

Ludhiána.—The vaccinators of this district were employed on sanitary work from the month of May to October 1883 inclusive, and 1,154 villages and towns were inspected by them during the period under review. The number of villages and towns of this district amounts to 864, but some of the vaccinators visited the same towns and villages more than once.

Juliundur.—Six hundred and twenty-one out of 1,252 villages were inspected by the vaccination staff of the Jullundur District during a period of 5½ months.

Hoshiárpur.—The number of towns and villages inspected by the vaccination staff was 1,263 from 1st May to 30th September 1882. The work performed by them in these months was the examination of chaukidars' books as regards births and deaths, inspection of towns and villages, as to their sanitary condition, the removal of house sweepings, stable litter and refuse matters to appointed sites, and the protection of wells from pollution, and other sources of water-supply. Each vaccinator was furnished with a copy of Dr. Cunningham's Sanitary Primer for his guidance.

Kángra.—In this district the vaccinators were employed in vaccination all the year round.

Gurdáspur.—Two thousand and fifty-three villages were inspected by the vaccinators, and "contrary to what I expected," says Dr. Henderson, "their visits seem likely to do much good."

Siálkot.—One thousand nine hundred and ninety-eight villages were inspected by the vaccination staff from 1st May to the middle of October.

Lahore.—The vaccinators were not employed on sanitary work. The Civil Surgeon "kept the vaccinators at head-quarters, and employed them in the dispensary, where most of them were taught compounding and have learnt something about the use and doses of drugs. They were also taught the elementary principle of sanitary science by Assistant Surgeon Brij Lal Ghose, Rai Bahadur."

Gujránwála.—Three hundred and twelve towns and villages were inspected by the vaccinators between the 15th May and the 30th September.

Ferozepore.—Nine hundred and twenty-seven villages were inspected by the vaccination staff during the months of May to September inclusive.

Ráwalpindi.—The vaccinators when going over the district sent in sanitary reports of the villages visited; and these were forwarded to the Deputy Commissioner by the Civil Surgeon when any action regarding sanitary reform was considered necessary.

Jhelum.—The members of the vaccine staff were deputed to make tours of sanitary inspection during the period that elapsed between the 15th April and the 30th September. The Deputy Commissioner, Colonel J. Parsons, states "that the vaccination staff has been specially directed to report on villages individually, with a view to improvements in sanitation being effected when practicable."

Gujrát.—Two hundred and twenty-four towns and villages inspected with their registers of births and deaths from April to September 1882. One man was attached to each dispensary.

Shahpur.—All the towns and villages in this district were inspected by the vaccinators during the months of May to September.

Mooltan.—Five towns and 872 villages have been inspected by the vaccination staff of this district from May to September 1882.

Jhang.—Five vaccinators and one native supervisor commenced their inspection work in May, and inspected 450 villages up to the end of September. Their inspection reports were sent by the Civil Surgeon to the Deputy Commissioner, who ordered the Tahsildars to have the suggestions carried out through the lambardars. Rai Bahadur Chetan Shah, the Civil Surgeon, states that "though very little, yet some good has undoubtedly resulted from these inspections; generally speaking, the villages were cleansed for the time when the vaccinators were there, and many of the drinking water-supplying wells received some attention by way of protection against pollution."

Montgomery.—The vaccination staff inspected 3 towns and 327 villages from July to October 1882.

Muzaffargarh.—The vaccinators inspected 42 villages and towns during the year between May and July. After July it was almost impossible to inspect any part of the district on account of the extensive and long-continued floods.

Dera Ismail Khan.—Two hundred and thirty-one villages from April to the end of September were inspected.

Dera Gházi Khan.—Thirty villages were inspected from May to September.

Bannu.—Three hundred villages were inspected from 1st April to 30th September 1882.

Pesháwar.—The district authorities did not approve of the employment of the vaccinators as sanitary inspectors, consequently during the hot weather they were employed in the city of Pesháwar as food inspectors, in which capacity they proved very useful. They were employed in this way from May till September. They were during the year taught the rudiments of sanitation and examined by the Assistant Surgeon of the city dispensary. They were found to have a very fair knowledge of Dr. Cunningham's Sanitary Primer.

Hazára.—Number of villages inspected 35 only.

Kohát.—Almost every village in the district, to the number of 400, was inspected. The vaccinators were employed in this duty from the beginning of May 1882 to the end of September 1882.

59. From the numerous reports of action taken by district authorities to carry out the suggestions of Inspecting Officers, as detailed below, I find that a great deal of practical work, in the way of improving the sanitary condition, especially with regard to the monopoly of town sweepings and filth by the Municipal Committees, has been effected. In the case of several towns in which the town refuse was regularly stored and systematically disposed of as manure for fields and fuel for brick-kilns, there has been not only a marked improvement in the general cleanliness of the town area, and this without any extra expense, but so far as statistics prove in their healthiness also. My chief aim, of late years, has been to have some solid work done in this direction. It is needless to report, year by year, the measures which have been suggested as the results of experience and have been found practicable in remedying the most common defects obtaining in conservancy of towns and villages. In the case of towns, there can be no question of the advantages of an improved system of conservancy under the careful supervision of Municipal authorities. The great difficulty is in the way of improving the sanitary condition of villages. At present the most pressing requirement of a Punjab village is the selection of a suitable site for filth godowns, not less than 200 yards distant from the inhabited locality, and the storage there of village sweepings regularly by one or two sweepers employed for the purpose. There should be no difficulty in dividing the stuff thus stored when required by the villagers as manure for their fields any more than there is in the division of crops among co-partners in a field.

Action taken by Municipal and District Committees on the suggestions made in the Sanitary Inspection Reports during the year 1882.

KARNAL DISTRICT.

Panipat Town.—It is intended to metal all the city streets and construct pacca side drains gradually as funds are available. All the principal streets have already been metalled and provided with pacca side drains. The small streets are now being taken in hand. One street "Purbiya Gate" had just been completed at a cost of Rs. 805, and also the circuit road between "Ansuri and Shah Wilayat Gates" has been metalled and provided with pacca side drains at a cost of Rs. 3,370. Thus it is hoped that within 5 or 6 years almost all the streets of the Panipat town will be metalled and provided with pacca side drains. The manure heap on the north-east side of the city has already been removed to the place indicated by the Civil Surgeon.

Kaithal Town.—Three additional culverts have been constructed this year on the circuit road to facilitate carrying off city water. The Municipal Committee of Kaithal has been requested to arrange for the disposal of the filth from latrines as recommended by Dr. Dennys. The income of the Municipality is not large enough to keep all the tanks in good order, but some money will be provided in the current year for the repairs of such as urgently call for repairs. The four latrines have been demolished as suggested by the Civil Surgeon. Both the slaughter-houses have been provided with flooring of Agra stone with pacca side drains and cisterns.

Kamhopura Village.—The improvements suggested by the Civil Surgeon on 2nd Class Vaccinator Utam Chand's report have been carried out.

Uncha Samana Village.—The enclosures for manure, pigs and *chamars* have been made by order of the Deputy Commissioner, as suggested by the Civil Surgeon.

Certain Villages.—The suggestions made by the Civil Surgeon on the reports of certain vaccinators of the villages of Kalrum, Mabarkabad, Busdhara, Ganjogurri, Ugra Kheri and Minri have been carried out.

SIRSA DISTRICT.

With regard to the Municipalities measures have been taken as far as practicable to remedy the defects pointed out. New drains, for example, are being made for the bazár at Fazilka, and orders have been issued to comply with suggestions as to Ellenabad and side drains there.

With regard to the villages the attention of the lambardars has been drawn to the remarks of the Civil Surgeon both by Deputy Commissioner personally at some of the villages and by the Tahsildars. "As long, however, as we have no compulsory powers, such as those levying special conservancy taxes" (says the Deputy Commissioner), "our efforts must necessarily be confined to moral suasion." Deputy Commissioner trusts, however, that next cold season there may be some improvement. In the matter of sanitation the Bagars rank first, the Sikhs next, and the Mussalmans last. The principal offenders against sanitary laws are the women, who are too indolent to remove their house refuse to a proper distance from the village. It is not easy to bring any effective influence to bear upon them, or to induce them to alter their ancient habits; endeavours, however, have been made to reform the most glaring abuses, such as the deposit of filth inside the village, and the excavations of hollows, by earnestly exhorting the zaildars and lambardars on these points.

UMBALLA DISTRICT.

Shahabad Town.—The suggestion made regarding the state of ground around the blacksmith's and other two wells has been attended to.

Thanesar Town.—The drains have been cleared out, and are being improved and extended as funds are available. They will be built on the saucer pattern.

HOSHIARPUR DISTRICT.

Hájipur Village.—The lambardars were directed through the Tahsildars to carry out the reforms suggested by the Sanitary Commissioner. Village sweepings are now removed to a distance of 100 yards from the village habitation. The proprietary body of the village have already some sweepers at their service, who are paid from village funds.

Hariána Town.—The Committee have appointed two additional bhistis and sanctioned an estimate of Rs. 220 for a new drain, and Rs. 100 for repairs of paving.

Mukeríán Town.—From this year's available income of Rs. 600, Rs. 500 has been voted for repair of drains and pavement.

Bahadarpur Town.—To carry out such repairs of drains the Committee voted a sum of Rs. 970, and the repairs to the principal drains have been completed. The five wells which were in bad state of repair have also been repaired and cleaned.

Garhdiwála Town.—The Committee voted a sum of Rs. 200 for repairs of drains and pavements.

Ahmadpur Town.—Five sites have in different places been fixed for the deposit of filth, &c.

Khanpur Town.—The attention of the Municipal Committee was specially called by the Deputy Commissioner to the remarks alluded to in this town. An additional bhisti and a sweeper have also been employed. The bad wells have been cleaned.

Gharshankar Town.—At Garhshankar a Municipality has only lately been established. The Committee have not got sufficient funds to repair or re-construct the pavements. The repairs of the well have been undertaken. The 16 wells remaining uncleaned will also be cleaned in the beginning of the summer.

Mahalpur Village.—The attention of the lambardars was officially called to the remarks of the Civil Surgeon as to the state of drains and pavements. The lambardars report that in that village there is a custom by which the owners of private houses have to repair the drain adjoining their respective premises, except in the case of such public places as the vicinity of wells, &c. They promise to use all their influence to have the drains put in order, and hope that within three months the drainage of the village will be improved and pavements repaired. There is no Local Committee in the village.

Baláchor Village.—The lambardars were directed through the Tahsildar to have the filth, &c., removed to a distance of at least 200 yards from the village habitation. The Tahsildar now reports from personal inspection that this order has been carried out.

AMRITSAR DISTRICT.

Majitha Town.—The complaints made by the Civil Surgeon have been pointed to the Municipal Committee of the town, and measures are now under consideration for the improvement of the sanitary condition and for placing the conservancy arrangements on a better working footing than heretofore.

With reference to Civil Surgeon's remark as to there being no fixed place for the deposit of filth, &c., the Municipal Committee have selected four places for this purpose, and on which alone all the manure of the place will be deposited.

GURDASPUR DISTRICT.

Noushera Village.—The District Overseer has been directed to proceed to Noushera and prepare a rough estimate of cost of filling in the ponds nearest the village. He has been also ordered to see what the cost of raising coping 6 inches high by 6 inches in breadth to all of the four wells in the village would come to. These copings will be paid for by the villagers, as also for the *katkarras*, which must be placed over the wells.

In the matter of ensuring cleanliness for the future, the Deputy Commissioner has warned the lambardars that the inhabitants are not to be allowed to leave filth and ordure about the village precincts, and that no person may be permitted to ease themselves within 200 yards of the village wall, and that within this area cleanliness must be seen to. On the 1st January the Tahsildar has been instructed to visit the village and to report, and if by then very considerable improvements have not been effected, Deputy Commissioner will probably have to take action on the criminal side.

LAHORE DISTRICT.

Kasúr Town.—With the assistance of the Tahsildar, Naib Kanungo, zaildars and lambardars, whom he took with him round the town, the Extra Assistant Commissioner has had all places where there was any filth accumulated made as clean as it was possible to make them, and replaced five female sweepers as suggested ; and the slaughter-house has been extended and the floor made sloping and pacca.

The use of the brick kilns to the north and south of the town complained of has been prohibited and arrangements made to fill in some of the large excavations alluded to.

Khem Karn.—Places which were found dirty have been cleaned, and supervision of the conservancy of the town has been distributed between members of the Municipal Committee. In future each member will look after the cleanliness of the section allotted to his care.

Considering the population of the town, as shown by the last Census, the conservancy establishment is inadequate. Application has been made to Deputy Commissioner for sanction to appointment of two sweepers more. This has been sanctioned.

Arrangements have been made for construction of a slaughter-house ; on sanction being received, the building will be commenced.

Notices have been served on owners of dilapidated buildings to execute repairs and that at once.

Patti Town.—Arrangements have been made to make the floor of the slaughter-house sloping. The Deputy Commissioner's permission to have this done had already been obtained. This work is being carried out by the members of the local Municipal Committee. The members of the Committee have been directed to pay very great regard to the cleanliness of the town.

Chunian Town.—Small pottery kilns within the town were found to be a nuisance, and arrangements have been made through the lambardars for their removal outside.

Algon Village.—The Extra Assistant Commissioner of Kasúr reports that with the aid of the Naib Kanungo and zaildar he has had the village cleaned and the heaps of cow-dung removed. The lambardars were called and warned to see that the place is kept clean in future.

Pohwind Village.—The Naib-Kanungo was deputed to visit the village. He has had it cleaned.

Munhala Village.—With the aid of Naib-Kanungo and Nabi Bakhsh, Zaildar, cleanliness has been effected. The heaps of cow-dung, &c., towards the south have been removed. The lambardars of this village have been warned against allowing accumulation of filth in future.

Battoa Village.—The Naib Kanungo was sent to the spot and has had the heaps of cow-dung and filth which were stored towards the south-east of the village removed and the place cleaned, the lambardars being at the same time warned to see that things do not relapse into their former state.

Ghariaia Village.—The heaps of cow-dung which lay near the village have been removed. Lambardars and people warned.

Burj Kalan.—The village has been cleaned. Wherever there were heaps of cow-dung, these have been removed. The lambardars and zaildars have been warned to see that the village is kept clean in future.

Sahjra Village.—The heaps of cow-dung and refuse matter complained of have been removed and the lanes cleaned, and lambardars have been warned against permitting filth accumulating in their village again.

Khari Village.—The Extra Assistant Commissioner of Kasúr reports that with the aid of Bahadur Singh, Zaildar, he has had the village cleaned and the cow-dung heaps complained of removed.

Chehiki Village.—Partab Singh, Zaildar, was deputed to visit the village ; the cow-dung heaps complained of have been removed, and the whole place cleaned.

GUJRANWALA DISTRICT.

Wazirabad Town.—The Committee is of opinion that, if the funds cannot afford so large an allotment of Rs. 1,148, the roof of one latrine alone (the one nearest the old Dâk Bungalow) be put in hand this year.

Resolution has been passed to apply at once for sanction to construct the enclosure wall for refuse store across the Palku.

Rupees 272-6-0 has been sanctioned to repairs of 26 wells, parapets and cisterns.

Certain Villages.—In respect to these villages general orders were issued in November last with regard to the disposal of manure outside the circular roads, and Patwaris were directed to note in their diaries, bi-monthly, whether these orders are attended to. The Tahsildars have now been called upon (1) to examine, test and report upon a number of Patwaris' diaries with reference to these orders; (2) to finish lists of all villages of which the circular roads are not in good order and clearly defined; and (3) to furnish lists of all villages in which there is not a colony of "churas" (sweepers) maintained.

With special reference to this particular report, the Tahsildar has been ordered to take action and report.

Shekhupura Village.—General orders have already been issued prohibiting the storage of manure and filth within the circular roads of the village, and Tahsildar has been instructed to inquire as to whether any villages are without colonies of "churas" settled in them as village servants.

Sadoki Village.—The circular road has been repaired and the wells cleaned.

Mugal Chack Village.—The Tahsildar has been directed to see the definition of the circular road, to prohibit the excavation inside it, and to have the village swept.

Kalaski Village.—General orders have already been issued prohibiting the storage of manure within the circular roads of villages. The Tahsildar has received instructions to see that they are attended to.

FEROZEPORE DISTRICT.

Ferozeshah Village.—The Tahsildar reports that (1) the cleanliness of the village is much improved; (2) the well inside the village belonging to Jhanda Singh had been cleaned, and that a parapet had been constructed round it.

Sultankhanwala Village.—It appears that on one occasion Colonel Maxwell, Deputy Commissioner, visited the village when on tour in the cold weather, and then fixed places for storing manure and refuse, putting up pillars to mark the sites selected; and the arrangements made by Colonel Maxwell are fairly observed, but of course in a rural village it is not possible to expect complete observance. The heaps of refuse seen at the entrance to the village have been removed. The holes or pools near the village will be filled up in the cold season.

RAWALPINDI DISTRICT.

Rawalpindi Town.—A Sub-Committee is already appointed for the purpose of looking after the sanitation of the city. They report that iron receptacles for night-soil have been replaced, and steps will soon be taken to repair latrines, and that provision has been made in the next year's budget for the repair of the main gutter.

GUJRAT DISTRICT.

Jalalpur Town.—Resolved that the suggestions made by the Civil Surgeon for the sanitary improvements of the town be kept in view; the outfall drain on north-east side, which the Civil Surgeon recommends to be extended, will be at once taken in hand, and as to the three excavations, two on west side and one on south side of the town, which hold foul water, the question has been referred to the Sub-Committee for report and suggestions in order to remove the defect.

Kotla and Bhadar Villages.—The lambardars have been informed by the Deputy Commissioner of the defects pointed out by the Civil Surgeon, Gujrat, through the Tahsildar, with orders to remedy them.

Kharian Village.—Orders issued to Tahsildar to instruct the people to improve ventilation.

Twelve Villages.—The Tahsildars of the district have submitted their reports that they had summoned the village headmen of the villages concerned, and that these men had attended and stated that they had carried out the suggestion about the conservancy arrangements of their villages, and that in future they will bear in mind the suggestions for improving the cleanliness of their villages by removing impurities to a distance, and by looking after the ventilation of the houses of the inhabitants of the village.

SHAHPUR DISTRICT.

Kufri and Kura Villages.—Measures have been taken by the Deputy Commissioner, Shahpur, to improve the sanitary conditions of all the villages of the district.

JHANG DISTRICT.

Shorkot Town.—Some streets have been paved and others will be paved as soon as the funds are available for the purpose. Four manure godowns were proposed (in addition to the two already existing), of which three have been duly constructed. The people have been warned to remove the filth of their houses to the fixed manure godowns and proclamation has been duly made to that effect. Some of the defects in connection with the several wells for supplying drinking water have been removed, and steps are being taken to remove the other defects as soon as possible. The sweepers have been fined for neglect of duty and warned to do their work carefully in future.

Dry earth is used and a "*pháora*" (rake or hoe) provided to the sweepers in charge of the latrines.

The ordure is buried in trenches outside the latrines at a distance of 20 yards. One more sweeper has been provided in the current year's budget for the latrines.

Ahmadpur Town.—The conservancy sweepers are strictly supervised by the members of the Committee, who have been made responsible for the conservancy of their respective "mohallas." Nearly Rs. 300 have been expended in 1882-83 on the pavement of the town streets; the remaining streets will be paved in the current year.

The estimates for construction of masonry drains in connection with the wells have been prepared, and it is hoped that they will be constructed in the current year. Four places have been fixed as manure godowns. Some of the defects under water-supply have been removed: others will be removed as soon as possible. The conservancy establishment is strictly looked after by the members of the Municipal Committee, *vide* remarks under head "streets and drains." Boundary pillars have been ordered to be erected, beyond which, people must go to themselves.

Chiniot Town.—The Deputy Commissioner held a special meeting of the Municipal Committee to consider the necessary sanitary improvements that were urgently required.

Jhang Town.—Orders for preparation of estimates for improving the slaughter-houses have been issued, and it is hoped that the necessary improvements will be made during the current year.

Kot Isa Shah Village.—Parapet and wooden coping have been provided against pollution at one well. Two families have ceased to tether their cattle at night under the same roof with themselves.

Haveli Bahadur Shah Village.—Three sites for manure godowns have been appointed at a proper distance from the village. A well has been provided with a mud parapet.

Chela Village.—The drinking water-supplying wells were, to a certain extent, improved.

Pirkot Village.—The wells supplying drinking-water have been better protected by providing parapets and *chanas*. Two sweepers have been appointed under a promise of being paid a certain quantity of grain from the harvest and a certain fee on marriage occasions. The lambardars of the above village have managed to have the sweepers paid by the villagers.

Paka Naulan Village.—Parapets have been provided for the protection of one of the wells supplying drinking water.

Kund Sargana Village.—The drinking water-supplying wells have all been provided with mud parapets.

Bagh Village.—The filth, &c., was removed from the village through the Tahsildar.

Mirak Village.—The Tahsildar of the Shorkot Tahsíl was deputed to carry out the suggestions, and one well has been protected against pollution.

Summary of the Annual Sanitary Reports of the Deputy Sanitary Commissioners, Eastern and Western Circles, for the year 1882.

Dr. J. O'Neill, the Deputy Sanitary Commissioner of the Eastern Circle remarks as follows under the following heads:—

Registration is still in a backward state, though I am glad to see a little more attention is paid to it in some places than before. I have little to add to what I said on this subject in my Sanitary Report for 1881, when Deputy Sanitary Commissioner of the Western Circle, still, I wish to again bring to notice the great aid given to registration by the midwives of the Municipal towns of Shahpur, who report each birth at the dispensary, and, from the register kept there, the Municipal Registrar copies weekly those entries which are not in his own register. The

system is a first class one ; it entails no further expense than making a proclamation throughout the city that midwives should report all births at the dispensary. I have not the slightest doubt that if the plan be tried the birth-rate of the province will rapidly increase. As it is, Bhera Municipal town, Shahpur, shews the high birth-rate for 1881 of 58, exceeded only by Delhi Suburbs (*vide* Punjab Sanitary Report for 1881, page 8), and examination will shew the birth-rate of the Municipal towns of Shahpur is always high, though, during my service in that district, I never understood why the females were more prolific than elsewhere.

As the birth and death registers are kept in the vernacular they are rarely or never examined by the Civil Surgeons, who, as a rule, cannot read the character, and it is in vain to imagine the Thana Moharrir will assist him ; on the contrary, the Moharrir will do all in his power to mislead. In fact, one might as well send a blind man to examine the registers as an officer who cannot read the character. What is the remedy ? Take the inspection of registers out of the hands of the Civil Surgeons and make it over to the Assistant Surgeons, and this only if he cannot read the vernacular. If it is understood, the Assistant Surgeon is only to examine when the Civil Surgeon is incapable of doing so, the latter will, even if his knowledge of the subject be very slight, maintain he can do so, otherwise he is driven to admit his dependence on the Assistant Surgeon ; consequently, the Assistant Surgeon should be expressly appointed to do the work, and in the rare case in which a Civil Surgeon is able to read the registers he can see how the Assistant Surgeon makes his inspection. If the work be made over to the Assistant Surgeons I can call for regular reports of inspections, though it is likely the prospect of travelling allowance will be sufficient to make them inspect frequently. The Thana Registers of Births and Deaths ought to be inspected every two months. I myself during my tour can examine only a very small fraction of all the Thana and Municipal Registers, whereas, the inspection to be of any use should be frequent and regular.

In some places the chaukidars have represented the necessity of arrangements being made to have them paid by the Tahsildar and not by the lambardars of the villages. Lambardars frequently pay irregularly and introduce the truck system.

During the summer the vaccinators were for the first time employed on sanitary work, inspecting villages and furnishing reports to the Civil Surgeons. In some cases the vaccinators did nothing more than walk from village to village and merely informed the Civil Surgeon so many villages had been visited ; in other cases disputes arose between them and the lambardars. There is much difficulty in working the system, but I think there is a mistake made in attempting too much. It seems to me it would be better if, for each district, a list was drawn up of the large villages only, small ones being carefully excluded, and the vaccinators were directed to visit those villages only and report on them. This would reduce the work, bringing it within reasonable bounds, and the small villages might safely be left alone. I have heard from several officers that rules have been formulated for vaccinators during the hot season, but, as no copy of the rules reached this office, I presumed the statement was not quite correct.

The inspection reports of Municipal towns I made during the year were submitted, as soon as drawn up.

This office, and probably the Sanitary Commissioner's also, have no opportunity of knowing the extent to which the Civil Surgeons supervise the vaccination of their districts. If it were laid down that all travelling allowance bills drawn for inspecting sanitary and vaccination work should be countersigned by the Sanitary Commissioner, the necessary information would be gained. As it is I am sure there is great difference between the kinds of supervision exercised by different Civil Surgeons. I think journeys are mainly made for the inspection of vaccination work ; for Civil Surgeons, as a rule, do not like reporting on the dirty state of towns and villages, as such reports are not likely to foster feelings of kindness and friendship between them and their Deputy Commissioners, and the more thorough the reports the less will the Deputy Commissioner think there is necessity for the Surgeon to leave his head-quarters to make a journey in the district.

Dr. B. Doyle, Deputy Sanitary Commissioner, Western Circle, remarks that—

In some cases lambardars affix their seals to the entries in the birth and death registers, in other cases they undertake no responsibility in the matter. Many chaukidars have complained to me that lambardars pay them less than their full pay and at irregular times. Those chaukidars whom I have spoken to on the matter generally wished that they should be paid from the Tahsil, which I believe was the case formerly. As registrars and chaukidars are public officers, it seems desirable that either lambardars should themselves undertake some responsibility in the matter of registration or else that the chaukidars should be paid regularly and fully.

The autumn fever which prevailed along the tracts flooded by some of the great rivers was the most notable disease. When in Jhang, I sent you a report on the subject. In Lahore City, where vaccination is most backward, an epidemic of small-pox broke out during the year.

The new scheme has worked well generally. In the frontier districts vaccination is still backward but progress has been made. In Kohát, however, no progress has been made. A correspondence on the subject has grown up, which will be sent to you in due course. In Lahore City the Municipal system has failed. In the Jhelum District

the Civil Surgeon has reported badly of the quality of the work. I shall return to these points. There is good reason to believe that vaccination is much less unpopular than it was at first, and I believe many people see that it affords protection against small-pox. In those parts of Ferozepore and of Lahore Districts, which I have just visited, the work had gone on smoothly. The difficulties incidental to arm to arm vaccination necessarily retard its popularity.

In every district, however, the assistance of the district authorities has been found necessary, and this even when vaccination is not unpopular. The comfort of the people engaged, more particularly of the vaccinifers and their mothers and the economy of the vaccinators' time, is greatly promoted by having proper arrangements made between the villages concerned. Lambardars will in concert make such arrangements only when they have been instructed to do so by the district authorities.

The arm to arm method is carried out as far as possible. In a few places lymph on glasses has been carried from village to village, the main body of children, within the village, being done arm to arm. This entails inferior work, and it is to be hoped that next year arm to arm vaccination may be fully carried out everywhere. Most of the complaints that have been made against vaccinators have naturally arisen in connection with the supply of fresh lymph. To see that vaccinifers and their mothers are treated as kindly as possible, and to explain on every opportunity the necessity of using fresh lymph, is undoubtedly a very important duty.

Vaccination by punctures is everywhere adopted. This method is familiar to the vaccinators. It is, I think easier, quicker, and less likely to frighten the mothers than any of the modes of scratching. The most common fault is that the vaccinators are apt to puncture too deeply and to draw blood. This, in some cases, arises from an endeavour to do the work quickly. Some vaccinators also puncture upwards at times and withdraw the lancet at once, others, I believe, more judiciously make the puncture always downwards and allow the lancet to remain a little before withdrawal. In a few instances only have I seen the vaccinifer's arm washed previous to vaccination, and the common practice is for the vaccinator to wipe his lancet in his clothes occasionally and always before vaccinating a fresh child. The vaccinator generally tells the mother not to wash the child's arm for three days, and he frequently instructs her not to eat salt or *khatta* (acid) things. Vesicles in many cases get rubbed and broken. When this happens the vaccinator directs the mother either to wash off the lymph or to dry the arm without previous washing. Very often, however, the vaccinator instructs the mother to apply a greasy substance to the arm, such as *ghi* or butter. I have seen many cases of secondary eruptions from irritation caused by lymph from broken vesicles, and which had been allowed to remain on the arm. The usual practice is for the vaccinator to leave a paper with the lambardar, giving the information required for inspection. The inspecting officer is sometimes unable to obtain this owing to the absence of lambardar, &c. The mode of recording information, which will be required in the following season, varies. This record, date of vaccination, descriptive list of children born within the year up to date, and who have been left unvaccinated, &c., should, I think in all cases be made in either the birth or the death register so that it may be at hand when required. I would recommend that a code * of instructions for vaccination and for the after treatment of the child be drawn up, and that a copy of these in Urdu be given to every vaccinator before the commencement of next season. Copies might be given also to people likely to read the instructions, such as patwáris and teachers, and these latter might be invited to explain them to the senior boys. In this connection I might observe that lambardars frequently order those children off, who have gathered round the vaccinators simply because they are children. It is very desirable, however, should there be no real objections to their remaining, that these children should be allowed to remain. By seeing vaccination done as a routine, year after year, they will become familiar with it, and in consequence they may cease to fear it. The children also are naturally more curious to hear what the vaccinators have to say and they take this in more readily.

There is less attention paid to re-vaccination than might be. Dr. Massy has particularly remarked on this. In the case of boys of a suitable age who are being taught in schools re-vaccination might probably be often performed where it is now neglected. I believe the vaccinators themselves require instruction in the matter, and this should be included in the code of instructions.

With regard to the percentage of successful primary vaccinations, it is probably, in most cases, fairly correct. In 3,179 children inspected by me since my return from the hills I find the following results:--

12	×	7	vesicles.
2,562	×	6	„
176	×	5	„
159	×	4	„
165	×	3	„
67	×	2	„
14	×	1	„
12	failed altogether.		
12	doubtful, i. e., without any fairly good vesicle.		

Total ... 3,179

Including doubtful cases amongst the unsuccessful, this shows 99·24 per cent of successful cases. If the 14 cases with one vesicle be included amongst the unsuccessful ($12+12+14=38$ unsuccessfully), percentage of successful cases will be 98·80. There are no rules which define a successful case and probably the ideas of the various native superintendents differ on the subject. I believe, however, that under favorable conditions it is not difficult to secure good vesicles in about 98 or 99 per cent. of the cases vaccinated. Several times when I have seen a few bad vesicles amongst a number of children with good vesicles I have found on enquiry that the former has been done by glasses, while the latter had been done arm to arm. In part of the Zira Tahsíl, Ferozporc District, where many children were anæmic from fever, the vesicles were not so good as they were in other parts of the tahsíl, which are drier and healthier. The lymph in both cases was from the same source. It is possible that children suffering from the effects of fever do not develop as good vesicles as healthy children, even though the lymph be good, it is also possible that the lymph itself degenerates when passed through a succession of such children. In this case arm to arm vaccination would tend to become progressively worse in a tract rendered unhealthy from recent fever. It is a common opinion amongst vaccinators that debility from fever gives rise to inferior vesicles. On the other hand I saw very good vesicles last year along the Western Jamna Canal, where fever had been very prevalent in autumn. As fever, anæmia, and spleen are so common, it would be desirable to have the point worked out. It would probably be wise to have malarious tracts vaccinated late in the season, even though the autumn fever had not been very bad. Where this has been excessive vaccination must necessarily be deferred.

The amount of protection that is afforded by the present system of vaccination as judged by the vesicles and by the cicatrices, probably, differs greatly. In the Lahore District, where this year's work had been done sometime, the cicatrices were, as a rule, good, there being a fair amount of pitting. I inspected also several cases done in the season before; in these too the marks were fairly good, and the vaccination may be expected to afford protection. In Kasúr City the marks were inferior. In Ferozporc City and Sadr also the vesicles in many cases were inferior, though the work was more fully and better done than in former years. Formerly, in Ferozporc City, vaccination was done from the dispensary. In some cases only one, in other cases, two and rarely six, punctures were made.

Several of these cases were re-vaccinated, and it is possible that I may have taken some re-vaccination for primary vaccination. In Ferozporc City the lymph was started from tubes. From what I have seen in Rawalpindi District it would appear possible that the first batch of children who receive arm to arm vaccination may not develop as good vesicles as those of further removes (sic). This I find is a common idea amongst vaccinators. In the Ferozporc villages, the vesicles were, as a rule, much better, though the lymph came from the same source.

The larger Municipalities, which are usually at the head-quarters of the districts, are generally fairly well looked after. The smaller Municipalities, which are not the head-quarters of a tahsíl, are frequently very dirty. In some such cases the members have told me that, inasmuch as all orders concerning the town come from the Tahsíl, they did not consider it to be a part of their duty to look after the sanitation of the town. It would be very desirable to have the positions, in regard to sanitation, of Tahsildars and members laid down with precision, so that responsibility could be fixed definitely. The members of Committees, as a rule, give very little help towards vaccination.

Inspection reports of villages have been sent in from certain districts. Very little, so far as I know, has been done to improve village sanitation. In each district there appear to be large tracts of country in which the people have very similar habits and live under very similar conditions, *e. g.*, tracts of country irrigated by canals or wells, or altogether "barani," where cow-dung is the only fuel, where wood is partially used as fuel, bar, jungle, &c. It would probably be desirable to have sanitary regulations modified according to the circumstances met with in any given case. In some instances the vaccination staff have sent in reports of villages which have been kept in one of the district offices; in other cases vaccinators have come into collision with lambardars. When this happened the vaccinators seem to have thought it a part of their duty to endeavour to enforce lambardars to carry out sanitary observances. The utmost vaccinators can do, however, is to point out defects to the lambardars and villagers, and to report. It is very advisable that vaccinators should understand their position clearly, otherwise friction and unpleasantness are likely to occur.

Having taken up the appointment of Deputy Sanitary Commissioner last April, I proceeded to the Hazára District, where the Special Staff was at work. The Special Staff worked in the Gullies and in the Mari Hills during the hot weather. I was directed to proceed to Attock at the end of last May to arrange for the sanitation of Thandebir, where the Railway bridge is being made over the Indus. I submitted to you my recommendations. At the end of the hot weather I proceeded with my Special Staff to the plains in the Rawalpindi District. In November I was directed to report on the fever in the Jhang and other districts. I submitted to you a report bearing on the fever in the Masan Thana, Jhang District. The fever in other districts was probably similar in character. From the Jhang District I proceeded to Faridkot as His Highness the Maharaja asked that some of his subjects might be instructed in vaccination. Three of my Special Staff worked from the 22nd December to the end of the year in Faridkot. The other men went to Hazára. When arranging for Faridkot with His Highness I took the opportunity of inspecting part of the Ferozporc District.

**A Summary of Inspection Reports of Towns and Villages inspected
by Deputy Surgeon-General H. W. Bellew, C. S. I., Sanitary
Commissioner, Punjab, during the cold season of 1883.**

AMRITSAR DISTRICT.

AMRITSAR CITY—*Inspected on the 4th and 5th December 1882.*

The details of the population, area, topography, drainage and sewerage, and water-supply, &c., have been so often given in previous reports, that it is not necessary to go over the same grounds on this occasion. I propose rather to limit my remarks to some points of sanitary interest which occupied my attention on this visit to the city.

Conservancy. I found the public thoroughfares and general state of the streets in a remarkably clean and wholesome condition, and had an opportunity of seeing the new tramway system of conservancy in work. This mode of removing the street sweeping and city filth away to the extra-mural stores is both expeditious and cleanly, and a great improvement on the old method of carriage in donkey panniers, from which there was always loss and inconvenience by droppings on the way. The tramway system of carriage is, also, I understand, considerably cheaper. I would strongly recommend the early adoption of this method of removing town filth for the cities of Lahore and Delhi.

Slaughter-yard. The slaughter-yard for goats and sheep has been improved since my last inspection by flooring the interior area with a pavement of stone slabs, with a good slope towards the drains on either side. I visited the place without previous notice, and found all the arrangements in excellent order. Though the process of cleaning up after the morning's operations was still in progress, the whole air of the place was remarkably free from offensive smells. Altogether, the arrangements here are very creditable to the Municipal Committee, and the management of the Inspector in charge. The Lahore Municipality might well follow the example set by Amritsar in this matter.

Proposal for filling up Santokhsar tank. I understand that a proposal is under consideration of the Municipal Committee, for filling up the Santokhsar tank with fresh earth brought from outside the walls, and converting the area thus found into an ornamental square and garden with row of shops along the sides. The project is one easy of accomplishment and highly to be commended for the sanitary advantages associated with it. It is calculated that the rent of the shops will in the course of 10 years recoup the original outlay in effecting this very desirable transformation; and, of course, the annual receipts from this source will thereafter be clear profit to the Municipal income. I would most strongly urge, that the Municipal Committee do not allow this project to lie in abeyance. It is one of very great importance to the sanitary welfare of the city, not only on its own merits, but also as a first step towards a like dealing, with some of the other great tanks in this city, all of which are more or less seriously contaminated with sewage filth. I would suggest, that the Municipal Committee be invited to hold a special meeting at an early date with the view to giving effect to practical measures for carrying out the project above referred to.

Sewerage and drainage. The great out-fall sewer and drain on the Eastern side of the city has been recently completed and brought into connection with the similar one on the Western side, and the sewage of the city is now carried off in a single channel from the point of their junction. This channel, however, as well as the precipitation tanks in connection with it, is not yet completed, and I understand, that the work is held in abeyance pending the decision arrived at in reference to the drainage works recently sanctioned by Government for this city. I have received no communication regarding the nature and scope of these drainage works, and am unable to form an opinion regarding the efficiency of the existing arrangements in consequence. I shall be glad to be furnished with a copy of the project for drainage of this city, and station as proposed by the Department Public Works.

Vaccination. On the 5th instant, I had the pleasure of meeting 10 or 11 members of the Municipal Committee in their Town Hall, and took the opportunity to address them on the very important subject of vaccination in their city. Much inconvenience, and as a consequence dislike, of the practice have resulted owing to the want of a proper system of procedure, such as should combine with the requirements of the practice some consideration for the feelings and convenience of the people. I suggested to the members of the Municipal Committee that most of the causes of complaint and inconveniences alleged against the system of vaccination as at present carried out might be at once removed by the adoption of measures which I explained in detail. The most important of these measures in the establishment of fixed stations in different parts of the city at which the vaccinators should attend on fixed days and hours with their selected vaccinifer for the vaccination direct from arm to arm of the children to be thus protected, and who should be brought to these stations for this purpose on the days and hours fixed by previous arrangements. The vaccinators shall be provided with counterfoil books of tickets for vaccination. These tickets should bear the name of the child to be vaccinated, the

name of the father and the child's age, and the date and place at which it is to be vaccinated should be entered at the time the ticket is given to the parents. When the operation is performed the date should be entered on the ticket and the counterfoil, and the date on which the child is to be again brought for inspection to the vaccinator should be now entered on the parents' ticket, and they should be warned to present the child for inspection on the date entered. On this latter date the vaccinator should enter on the ticket, as well as the counterfoil, the result of the operation. By this method much trouble, inconvenience and loss of time would be avoided, but to ensure its success the people must co-operate with the vaccinators. The members of the Municipal Committee expressed their approbation of the method I proposed for their adoption, and promised to give it a trial. I would suggest, however, that the Municipal Committee be invited to hold a special meeting at an early date for the purpose of considering this subject and giving practical effect to its details. I would also beg to be informed of the steps finally taken by the Municipal Committee in this matter.

It affords me pleasure to be able to report satisfactorily on the general sanitary condition of this city and on the lively interest taken by the Municipal Committee in all that relates to its sanitary improvement. The intelligent zeal and ability of Mr. E. Nichol, the Municipal Secretary, are too well known to need commendation from me.

DERA ISMAIL KHAN DISTRICT.

DERA ISMAIL KHAN TOWN—*Inspected on the 17th and 18th December 1882.*

This town was last inspected by me in February 1881, and in submitting my report to Government then, I made the following remarks:—"A great deal has been done during the past few years by the Deputy Commissioner, Major Macaulay, to improve the general sanitary condition of this town. Preliminary remarks regarding town. Much remains to be done in the matter of minor details, which are not without a special importance of their own, for on a due attention to them depends the utility of the greater works already carried out. I would recommend that the conservancy establishment be more carefully supervised and systematically worked, with the object of effecting a more thorough scavenging of the parts of the town off the main thoroughfares, and that the care of the wells be made a more important duty, either of the bhisti establishment or sweeper staff, as the Municipal Committee may consider advisable."

During my recent inspection I found the town generally in a very tidy and well-swept condition, and the conservancy staff carefully supervised. The town sweepings and filth, &c., are carted to an enclosed storage ground some distance from the town and there sold for the benefit of the Municipal funds. The amount realized this year by the sale of this manure material is considerably above that realized in the preceding year, but the sum is far short of what might be obtained by a more economical management of the manure. On visiting the storage ground I found the enclosure full and a large area around it also covered with low scattered heaps of manure stuff, but it was a very coarse rubbish and such as cultivators would not care to put in their fields. I think it would be found more advantageous if the town sweepings and filth latrine ordure, slaughter-house offals, and every sort of filth were all piled together in higher and more compact heaps so as to favor the more rapid formation of mould. At present the stuff is scattered too loosely and over too wide an area. If all be piled up inside the enclosure and left to crumble into mould, say for a year, it would be more readily sought after by the cultivators and fetch a higher price as being of richer quality and more suited to the direct use of the crops. I would suggest that the Municipality be invited to give this subject their special attention, as a simple means of not only improving their town scavenging, but also making it more or less completely self-supporting.

The water-supply of the town is from wells and a canal, and is considered generally good. Most of the wells are now protected by low parapet walls, as was suggested by me on the occasion of my previous inspection. Water-supply. Altogether, the town bore a very clean, prosperous and wholesome appearance, but there was some considerable prevalence of malarious fevers, mostly amongst the poorer classes of the people. The country on the side of the river Indus had been flooded to an unusual extent during the hot weather rainy season, but the town and cantonment escaped owing to the efficient preventive measures adopted.

At the time of my visit the whole of the vaccination staff of this district was employed in the Leia Sub-Division, and operations had not been undertaken in any other part of the district. Vaccination. I explained to the members of the Municipal Committee that it was a more advantageous method to prosecute operations simultaneously in all the sub-divisions rather than taking them, one at a time in successive years, as is now the practice. I also spoke to them in detail of the necessity of their making efficient arrangements for the vaccination of the town in a systematic manner by the establishment of vaccination stations at which the people should attend with their children on fixed days by agreement beforehand with the vaccinators. The Deputy Commissioner was absent on tour at the time of my visit, but the members of the Municipal Committee met me cordially and rendered me every assistance and evinced a lively interest in the sanitary improvements of their town. I shall be glad to be informed of the nature of the steps they have taken in respect to the improvement of the manure collection and the establishment of vaccination stations in the town.

EDWARDESABAD (BANNU) DISTRICT.

Inspected on the 20th and 21st December 1882.

The Town of Edwardesabad, at first called Dhulipnagar, sprung into existence on the return of the late General Sir Herbert (then Lieutenant) Edwardes to the Bannu District in the year 1848. It is, therefore, now only about 35 years old, and after the death of Sir Herbert Edwardes came to be officially designated Edwardesabad after its founder.

Preliminary remarks regarding the town.

The population according to the Census of 1881 is shown to consist of 3,169 males and 1,731 females—total 4,900. The town contains 793 dwelling houses and 620 shops, and there is also a second-rate serai belonging to one of the inhabitants. The last Census showed 135 unoccupied houses, but the Municipal Committee are proceeding against all owners of unoccupied houses now, and there is reason to hope that all houses will shortly be occupied. A new serai, with bonded ware-houses, has, however, been projected and budgeted for, and will shortly be commenced. The site chosen for this serai is exactly opposite the Lakkigate. It formerly consisted of a series of deep pits, from which the earth required for the construction of the town had been excavated. These pits have been for the most part levelled and silted up with alluvial deposit by turning a water-course from the Kurram river over the site; but as the level thus attained is considerably below that of the adjoining Lakki road it is being raised five feet or so artificially by earth brought from some waste land purchased by the Municipal Committee. This work is now half completed, but before the serai is commenced it is intended to arrange for a second alluvial deposit by turning the Kurram water-course over the site as before, and the level will then be brought up to near that of the Lakki road. Besides the pits alluded to, a large tank has also been filled in on this side. The outlay on this work amounts to about Rs. 400, and it is estimated that the levelling up will be completed for another Rs. 400. The filling up of these pits is an important sanitary improvement, for they were previously resorted to for purposes of nature and became receptacles for all manner of filth.

The town stands on a stiffish clay soil, and is naturally well drained into a water channel which flows past its Eastern side. The town is of a squarish shape and is intersected by two great streets or bázárs, the point of intersection being occupied by an open market place or "*Mundi*." I found most of the streets and side passages in a commendably clean and tidy state, and the drains and gutters in good order. Most of them are of the parabolic pattern and are kept free of deposit by daily flushing from a stream drawn from the Kurram river. The water from this stream enters the town at three points on the North side, traverses its area in parabolic drains of pucca masonry, and is discharged at nine points, beyond which the water flows into cultivated lands and is employed in irrigation. The fall of the water is between 4 and 5 feet in its course through the town, so that it flows with great rapidity and can be conducted almost everywhere over its area.

The water-supply of the town is plentiful and is derived from the Kurram river. There are besides two wells and a third is under construction. The well water is met at a depth of 120 feet. This depth does not prevent the employment of a Persian wheel, and this arrangement is in use on the *Mundi* wells and will be employed on the new well also. The well in the *Mundi* or market place is worked only during the warm season. It is completely enclosed with masonry and has a roof over the wheel. The water is served to the public through a closed reservoir, which is furnished with about 20 brass tops, of these 6 or 7 being screwed off for the special use of the Hindus. By this arrangement the water is effectually protected from the ordinary sources of contamination by contact with the public. The water keeps extraordinarily cool throughout the hot weather and is a great boon to the public.

The conservancy of the town has been greatly improved of late under the intelligent interest and diligent zeal of the Secretary to the Municipal Committee, Mr. F. Egerton, Assistant Commissioner. Formerly the night-soil was removed from the houses in carts and buried under four feet of earth outside the town. But for this work only two carts were employed, the night-soil, as a rule, being allowed to accumulate on the roofs of the houses (to which the occupants habitually resorted for purposes of nature) until perhaps once a week, when the cart would come round. In some of the houses which were provided with privy accommodation, the privy consisted of an upper story with a hole in its floor, and a lower story to receive the night-soil through it. In this lower story the ordure was allowed to accumulate until the space became inconveniently choked up, when the owner of the house called in the use of the conservancy cart. All this has now been changed, and the conservancy of the town has been put upon a sound and efficacious footing. By a resolution of the Municipal Committee it is required that every dwelling house in the town must have a privy on a plan which should be suitable to the requirements of the Municipality, and that adequate arrangements should be made for the daily cleaning of each privy and the removal of its ordure by the reconstitution of the conservancy establishment and the appointment of a well-paid energetic Darogha to supervise its work. The resolutions of the Municipal Committee on this subject are furnished to me by the Secretary, Municipal Committee, as follows:—

"I.—Every house and shop in Edwardesabad used as a dwelling to be provided with a privy, to be constructed at *his own expense*, by the owner on a pattern to be approved by the Committee; the Committee making advances for this purpose only to those who from their extreme poverty were absolutely unable to afford its construction.

II. Shopkeepers to be allowed to live in shops too small to contain a privy only on condition of their providing themselves with a commode with pottery vessel to be kept on the roof, and only used in cases of necessity when the owner could not leave the city owing to the gates being shut. The commode when used to be removed by a city *mehter*, who would receive a small remuneration from the shopkeepers.

III. No shops to be constructed in future and used as dwellings which should be too small to contain a privy.

IV. Every house occupier to be held personally responsible for the cleanliness of his own roof, though the said roof be connected by stairs with the street."

This is an excellent set of rules and worthy of adoption by other Municipalities.

The plan of privy approved by the Municipal Committee is one proposed by Mr. F. Egerton, and, in my opinion, is admirably suited to the purpose. A privy on this plan with two seats built of the best bricks and mortar cost Rs. 10 in Bannu. Mr. Egerton very justly claims for the plan the following advantages :—

(a).—" It must be cleaned out every day, there being no place which can act as a receptacle for an accumulation of night-soil."

(b).—" The under surface," (the floor) " being sloped renders the percolation of urine into the interstices impossible."

(c).—" It is easily cleaned and is a source of comfort to the Native."

(d).—" It fulfills all sanitary conditions, is *inexpensive and popular*"

The conservancy establishment as now constituted consists of—

1 Darogha or Superintendent at Rs. 40 a month	Rs.	40	0	0
2 Jamadars at Rs. 8 and Rs. 7 respectively	...	15	0	0
1 Sweeper at Rs. 6	}	...	226	0 0
4 " at Rs. 5 each				
50 " at Rs. 4 "				
1 Beldar at Rs. 6 and 5 Beldars at Rs. 5 each	...	31	0	0
2 Hackeri drivers at Rs. 6 each	...	12	0	0
1 Chalwishti at Rs. 6	...	6	0	0
1 Chaukidar at Rs. 6	...	6	0	0
1 Sweeper for camel lines at Rs. 2	...	2	0	0
Monthly Total		...	338	0 0

There are three public latrines outside the town and 7 Crowley filth carts are employed in removing the city filth daily. The filth is stored in walled enclosures or "godowns" situated at convenient distance, outside the town, and is there sold as manure. The yearly proceeds by the sale of this manure has been steadily on the increase. In 1881, the amount realized was Rs. 717. In 1882, it rose to Rs. 1,027, and in 1883 to Rs. 1,415. It is anticipated, that when the whole of the dwellings in the city have been provided with privies and the present loss by wastage is prevented by a more careful collection of the stuff, an income of nearly Rs. 3,000 will be realized by the sale of this manure. Mr. Egerton found that the night-soil of the sweepers, settlement outside the town, but within Municipal limits, used to be sold by the head sweeper who thereby realized Rs. 50 or Rs. 60 a year. He therefore sold the contract for this manure and realized for the Municipality Rs. 55 for it in the year 1882, and doubtless when the sweepings and filth of the whole town are completely monopolized by the Municipal Committee, the sum anticipated will be easily realized by its sale as manure.

As the people in the sweeper settlement—Thatti Khakroban—were found to be living in the utmost squalor and misery, Mr. Egerton appealed to the Municipal Committee representing that they were responsible for the condition of the sweepers, as a class, and on his suggestion, the Municipal Committee agreed to build a set of sweepers' quarters out of the Municipal Funds. A site was purchased so situated as to fall outside the city wall in the event of its extension in that direction, and the work was at once put in hand. The plan of the sweepers' quarters or Bazár Khakroban consists of two mohallas or wards, each comprising a double row of 11 rooms, each with its court-yard attached. The rooms and their court-yards are each 11 feet square all through the range, and the whole range is substantially built of kacha-pucca masonry upon a foundation of stone concrete. One half of the first mohalla is already completed and affords accommodation for about 55 souls. The other half of this mohalla and the second mohalla it is hoped, will be completed in a year or so, though there is the fear that want of funds will prevent the completion of the work during the year 1883-84. The completion of this work, however, at an early date is of so important moment, that I would urge upon the Municipal Committee, the most strenuous efforts to bring it to completion as soon as possible. Two privies will be built for the use of the sweepers, and it is anticipated that the sale of their night-soil as manure will in the end more than repay the Municipality for its outlay of about Rs. 1,100 plus Rs. 400 for the site. In the present year the sweepers are being provided with warm clothing by the Municipality—*Postins* for the men and *Mirzais* for the women. "This has been found necessary as the early hour at which they are employed renders them subject to Pneumonia."

The Municipal bye-laws for the prevention of nuisances are carefully observed, and special rules have been adopted by the Municipal Committee in relation to the sanitation of the *Mundi* and the nature of the goods allowed to be exposed for sale, so that *sabzi* or vegetables are not allowed to be left in the *Mundi* during the night.

There are two slaughter-houses, one situated nearly half a mile from the Lakki gate to the South-East, and another which is situated near the Mirian gate on the West side of the town. They are kept in a wholesome state, and the latter which I inspected was remarkably free from offensive sights or smells.

The burial grounds are situated, one a quarter of a mile from the Hawaid gate, and the other near the Kackkot bridge, half a mile from cantonments on the Kurram road. The bodies of Hindus are burnt on the stones in the dry bed of Kurram about a mile from cantonments.

Vaccination is not generally unpopular either in the Bannu District or in the town of Edwardesabad, but it has made but little progress during the year. In Edwardesabad only 117 persons were vaccinated in 1881-82, and this poor figure appears to be the result of want of arrangements in the prosecution of the work. Here, as elsewhere in the Province, the vaccinators give no previous notice to the parents of the children, and as a consequence they too often find them unprepared or unwilling to submit their children to the operation on a sudden and unexpected summons. I found the members of the Municipal Committee all strongly in favor of the practice and eager to promote facilities for its diffusion, and took the opportunity in the course of my address to them on the general sanitation of their town to explain in detail the procedure that should be adopted in order to make the practice popular and as little inconvenient as possible to the people, and I was glad to learn from the Secretary, Municipal Committee, before my departure from the station, that the Municipal Committee acting on my advice had selected a convenient spot in a central part of the city close to the tahsil, and had already arranged for the construction thereon of a vaccination house, 16 feet by 12 feet, with a verandah supported upon pillars. The place, I am informed, will, it is hoped, be completed in three weeks. With such a centre of operations established, the vaccinator should find no difficulty in his work, which, however, it will be necessary for him to arrange with forethought and method, as explained by me in detail.

Registration of births and deaths is fairly attended to, and the registers are inspected every week.

"The members of the Municipal Committee have all been working well when under immediate supervision" but, continues Mr. Egerton in his memorandum, from which I have drawn much of the preceding information, "they want 'initiative' and are apt to look on sanitary measures with good-natured *toleration* rather than energy, which degenerates when they are left to themselves into *apathy*." He adds, "it is men of energy as well as intelligence and integrity who are required to work sanitary reform, and amongst these may be classed both Pir Bakhsh Khan, the Hospital Assistant, and the Tahsildar, Sheikh Mehr Bakhsh. Without their aid I should have found it difficult to work any real reform in the city. They have throughout taken a lively interest in sanitation." For these men I would submit, for the favorable consideration of the Hon'ble the Lieutenant-Governor, a recommendation that they be granted by way of encouragement to the others some token of recognition of their services. Mr. Egerton's painstaking devotion as Secretary to the Municipal Committee is amply testified to by the great and lasting improvements he has effected in the sanitary condition of the town, and it is a pleasure to me to say that his labours have not been without good fruit as has been already shown.

KOHAT DISTRICT.

KOHAT TOWN—*Inspected on the 29th and 30th December 1882.*

The town is situated on the left bank of the Kohat Towi, where it turns Southwards round the base of the Bar Raisan spur, which is a terminal offshoot of the Saman range, and is built upon undulating ground, which is naturally well drained and traversed by several water-courses from some copious springs which issue on the surface close to the East face of the Fort. The soil is rocky and pebbly, with here and there thick crusts of stiff clay. Continuous with the town and extending Eastwards is the Military Cantonment, and beyond it again the ground rises in low rocky and stony undulations to the foot of the Jowaki hills. To the North, beyond the Fort, the ground slopes up to the hills of the Kohat Pass or Kotal, distant 3 or 4 miles from the town. Towards the West the land stretches in a rich valley along the Northern side of the Kohat Towi into the Miranzai country. Towards the South the country opens out into a rich cultivated tract along the course of the Kohat Towi for a distance of some 7 miles with a width of 5 or 6.

The town itself lies in a long strip extending East and West along the slope of the stony hill skirt into the alluvial plain below. It is enclosed by a wall about 12 feet in height.

The population of the town according to the recent Census is 13,490, namely, males 7,975 and females 5,515, or an increase of 2,447 souls since the Census of 1875.

There has been a very marked improvement of late in the drainage arrangements of the town. Five new drains have been constructed, namely, one from the Tahsil gate to a point where it meets the Abkari drain, close to the street which joins the new Shakardand drain.

The second from Shakardand to the Miyan Khel gate. The third from Mustafa Shah's new shops (where the drain lies below the main bazar) to Niazi gate. The fourth from Haman lane to a point where it meets the fifth. The fifth from Zyarat to Abbas' house, where it meets the third.

I found these drains as well as most of the streets and side passages in a commendatory, clean and tidy state.

There are 240 wells. The average depth varies from 12 to 39 feet in the plains, and from between 60 to 75 in the Sanger. Most of them are furnished with kacha and pucca parapets or platforms. The quality of the water is reported to be sweet and good. For the cantonment the water-supply is drawn from the springs near the Fort by underground channels through which it is distributed to the different parts of the station.

Conservancy Establishment.

The Conservancy Establishment consists of:—

1	Naib Darogha on	Rs.	12	...	Rs.	12
1	Jamadar	"	6	...	"	6
24	Sweepers each on	"	5	...	"	120
10	Bhistis " "	"	5	...	"	50
4	Conservancy cart bullocks, each	"	9	...	"	36
						Total Rs. 224

The street sweepings and other rubbish of the town are removed on donkeys and bullocks to manure stores at convenient distances from the town, and are sold for use as fuel in the brick kilns or as manure for the fields. There are also four Crowley carts employed, but two of these are at present under repairs.

There are only four latrines, namely, three outside the city walls and one inside; but, besides these, there are several places used as latrines and urinals selected by the people themselves for their convenience. I strongly deprecated this latter system, and suggested the erection of a few more public latrines on sites that would be convenient for the people.

The people are still neglectful on the subject of registration of births and deaths. In 1881, Rs. 36 were realized in fines from 13 persons, viz., 3 for deaths and 8 for births. In 1882, Rs. 36-8-0, all from 10 persons, for births alone. The attention of the Municipal Committee should be drawn to this matter, and the Mohalladars be enjoined to see to a stricter registration of births and deaths.

Sanitary Primer.

The Primer has been distributed through the Tahsildar to village headmen.

Summary of Inspection Reports inspected by the Deputy Sanitary Commissioners of the Eastern and Western Circles, Punjab.

(BY DEPUTY SANITARY COMMISSIONER, EASTERN CIRCLE.)

LUDHIANA DISTRICT.

LUDHIANA TOWN—*Inspected on (not given), by SURGEON J. O'NEILL, Deputy Sanitary Commissioner.*

Ludhiána is situated 6 miles South of the Sutlej. The country is level and in many places covered with large patches of sand. The city is very thriving and is a large grain centre.

On the day of my visit I found the streets clean, but some of the drains were dirty and in many places, throughout their course, water lodged from defective levelling. The channels are very deep, and show that a great deal of money must at one time have been expended in carrying out a system of drainage on an ambitious scale. Owing to the bottom of the drains having got out of repair, water, mixed with the liquid sewage, is allowed to stagnate in many places. The main outfall drains are of great depth and width, but only a small portion of the sewage is carried away in them. The side streets in many cases want surface side-gutters. Nothing has been done to improve the levelling of the drains since the city was inspected by the Sanitary Commissioner. The project for the drainage of the town, prepared and forwarded to Government for consideration, as remarked by the Sanitary Commissioner, is still under consideration.

All filth is daily removed to sites about half a mile outside the city in bullock carts and on donkeys. The sites are not walled in, but they are in unfrequented places, and too far removed to be dangerous to health. There is a large quantity of manure at present collected, and sales go on every day. The sweepers had thrown a lot of filth down an incline quite close to the latrines near the Fort. This was not an appointed site, and the accumulation of filth there was an irregularity.

The wells are about 300 in number, and were all cleaned in 1881, and five were again cleaned this year. The water is sufficient in quantity and easily obtained as it is not far from the surface. The wells I saw were in good order, but the drains for waste-water leading from them are in the majority of cases out of repair. The wells are covered in, but water that falls on the platform can find its way back into the wells. There is a very fine masonry tank, but it is always dry, unless during the rainy season, on account of the sandy nature of the soil.

The latrines are of the movable kind. There are over 100, and each can accommodate four persons. They consist of wooden frames covered with canvas and provided with seats. Those known as the Chouni latrines require mending and new canvas. The utensils are not glazed and they readily break. The broken pieces ought to be removed and not allowed to accumulate near the latrines. Last year the sale of manure realized Rs. 4,606. This is a very large sum, and it is expected the income of the present year will be even more.

The beef slaughter-house is about a quarter of a mile outside the city, and is in a satisfactory state. The shambles have been lately built and consist of a circular building with a large open space in the centre. The shops are on a well raised circular platform, and have in front a small thatch, which acts as a verandah. The shambles were clean the day of my visit. The new shambles were built at a cost of Rs. 4,060.

There are 9 burial and 2 cremation grounds.

Requests that the attention of the Municipal authorities may be invited to the several suggestions made in this report by the Deputy Sanitary Commissioner for the sanitary improvement of this town.

KHANNA TOWN—*Inspected on 1st Novr. 1882 by SURGEON J. O'NEILL, Deputy Sanitary Commissioner.*

Khanna is situated about 27 miles South-East of Ludhiána, and about 100 yards West of the Grand Trunk Road. The surrounding country is level and under cultivation.

A large portion of the streets has been newly laid down, the way being metalled, raised in the centre, and having on each side large open saucer drains carefully plastered and possessing a good outfall. The remainder of the streets are either paved with bricks on edge and have the usual drain running down the middle, or are quite unpaved. In the latter case there are no drains whatever and in the rainy season water probably lodges in the streets. At the time of my visit the town was clean and appeared to have been thoroughly well swept.

The drainage of the town is conducted beyond the Municipal boundary into large depressions, but in a town of this size sewage is small in quantity and does not accumulate so as to be dangerous to health, still, as a large portion of it is absorbed by the ground, it is recommended that drains be made in those streets where there are none. The town filth is removed by the Municipal sweepers to appointed sites, five in number. One of those sites is objectionable, being quite close to the Grand Trunk Road and about only 100 yards from the town gate. Formerly the filth was stored and sold, but as the quantity is not large the practice of selling it has been abandoned and it is now given *gratis* to the cultivators.

There are 25 wells in the town, the supply of water is ample, and the quality is said to be good. They were all cleaned between 13th October and 1st November. The wells of the town are in good repair, but one just outside the town and close to a large tank has been allowed to fall into disrepair, the ground round being slushy, as there is no channel to carry off waste-water. The platforms of the wells are good, but there is nothing to prevent water used by bathers from making its way back into the well. In Abbottabad and other places in the Hazara District I have seen a capital arrangement for the prevention of surface pollution of wells. I strongly recommend that a plan of this structure for the mouth of wells be furnished to all District Officers for guidance. The annexed plans may help to show how the Cantonment wells of Abbottabad are protected; but as they are necessarily defective, being drawn from memory, I think it would be well to obtain through the Executive Engineer properly executed plans which might be cheaply copied and distributed. For Municipal Committees, models might be made at a trifling cost, for it is probable an ordinary member of Committee might feel puzzled over the most accurately designed plans.

The top of the well represented by the dotted line (Fig. I.) is boarded over W W, a small open space being left in the centre through which the rope and bucket pass. A B C D is a frame to which the woodwork W W is attached. External to this wooden covering is a stone platform P P slightly

inclining from the well outwards (Figs. I, II) and having at its edge a channel L, which conducts waste-water to the channels K K. From each of the four corners A, B, C, D, a pole rises, the four poles joining at the pyramidal water E (Figs. II, III.). The lower portion of each side of the pyramid is boarded and faced with stone (F Fig. II) to a height of about $2\frac{1}{2}$ feet. The stone facing F is convex, (Fig. III.). At the upper portion of the poles transverse rods H H support pulleys, one to each side. The drawer of water stands on the platform P; he cannot conveniently stand on the edge of the stonework F. When the bucket rises above F, he draws it towards him and any water now spilt will fall on the stonework F, and thence flow down the platform P to the channel L, and then to the channel K, which finally carries it away. Should a native wash himself on the platform P, he cannot pollute the well, for the surface F (Fig. III.) keeps the bather at a distance sufficient to prevent water splashing from his body into the well. Even should water splash over F, the boarding W W affords additional protection.

One latrine, a portion of which is set apart for females. The ordure is buried in the fields and burned in the brick-kilns when the latter are working. Private latrines are very numerous. The filth is removed by the sweepers and given to the cultivators. There was a sale of manure in May last, Rs. 22 only being realized.

There are only two butchers' shops. The amount of meat consumed is very small, and there are no special arrangements, nor are any needed for the disposal of blood, &c.

The cremation ground is an open space to the west of the town. The graveyards are in a satisfactory state.

Requests that the attention of the Municipal authorities may be invited to the several suggestions made in this report by the Deputy Sanitary Commissioner for the sanitary improvement of this town with the following recommendations: (1) construction of drains in those streets where there are none; (2) construction of platforms to wells on the plan submitted by Deputy Sanitary Commissioner.

JULLUNDUR DISTRICT.

ADAMPUR TOWN—*Inspected on the 8th January 1882 by* SURGEON-MAJOR J. BENNETT, *Deputy Sanitary Commissioner.*

Adampur is a small Municipal town in the Jullundur District, of a quadrangular form, and open. It is situated on a level plain on the high road about half way between Jullundur and Hoshiárpur.

The main streets are paved in the old style, with concave surface and the usual shallow drain in the middle. In many places the pavement is very irregular and somewhat dilapidated, while the side streets and passages are for the most part unpaved. The street drains are badly laid, and in many the channels are completely obliterated by earth and debris, and the sewage water in those with open channels was seen to be stagnant. In the "Nikka Bazár" the drain in the middle of the street was in a filthy condition; its channel, rarely if ever flushed or cleaned, being blocked with black foul sewage deposit. Owing to the poverty of Municipal funds, not much can be done to remedy these defects, but more attention should be paid to keeping the streets and drains in a cleaner and more wholesome state.

The main line of drainage is from the North-East to the South-West. The street drains end on the skirts of the town, discharging their contents on the surface, there to remain until washed into the neighbouring ponds by the monsoon rains on the Western skirt of the town, where there are two large ponds into which the drainage of a large portion of the town is retained, and where the surface is considerably under the general level. The ground, not unfrequently during the rains, becomes inundated to a depth of two or three feet; here the soil and walls of the houses were seen to be very damp, and more or less saturated with nitrous efflorescence. The sweepings of the streets are burned on a brick kiln about 300 yards distant from the town, but the conservancy arrangements in force appear to be very inefficient.

From 17 wells, of which 13 are inside and 4 outside the town. The results obtained from the qualitative analysis of samples of water collected from different wells in the town were as follows:—From well No. 1 Nathawala, the water, which was perfectly clear and transparent, possessed chlorides, sulphates and nitrates in great abundance, probably of sewage origin. In water from well No. 2 "Gujranwala Kua," sewage salts were also detected in the form of chlorides and ammonia. The tube of this well was in a dilapidated condition, about a third of its surface having fallen in, and the ground round the low broken-down parapet was seen to be in an exceedingly dirty state. The waters of 4 other wells examined, although showing chlorides and sulphates in some excess, appeared to be otherwise well fitted for domestic use. The analysis of a sample obtained from a well situated near the North-East corner of the town, and apparently beyond the area of pollution, gave almost entirely negative results. Within 20 feet of a wall in the main bazár is the dilapidated tube of an old well into which the sweepings of the streets and debris of all kinds are thrown. During the rains this ash pit, by drainage from the surrounding soil, must necessarily be converted into a deep open cess-pool, and the water of the neighbouring well, situated as it is at a lower level, would be in imminent danger of contamination by leakage. It is highly advisable that this hole be closed up after removal of its con-

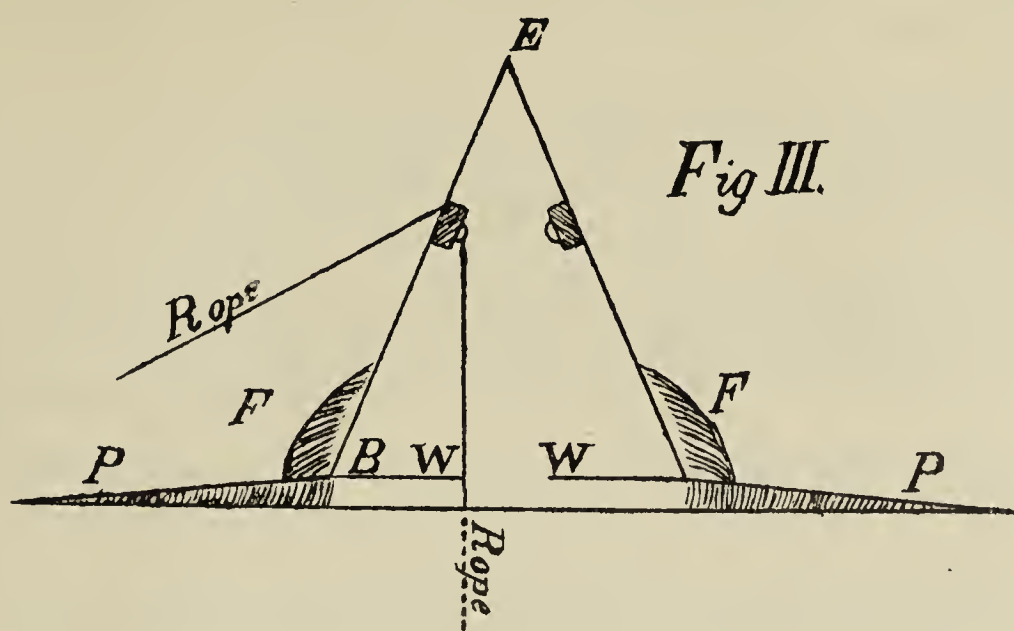


Fig III.

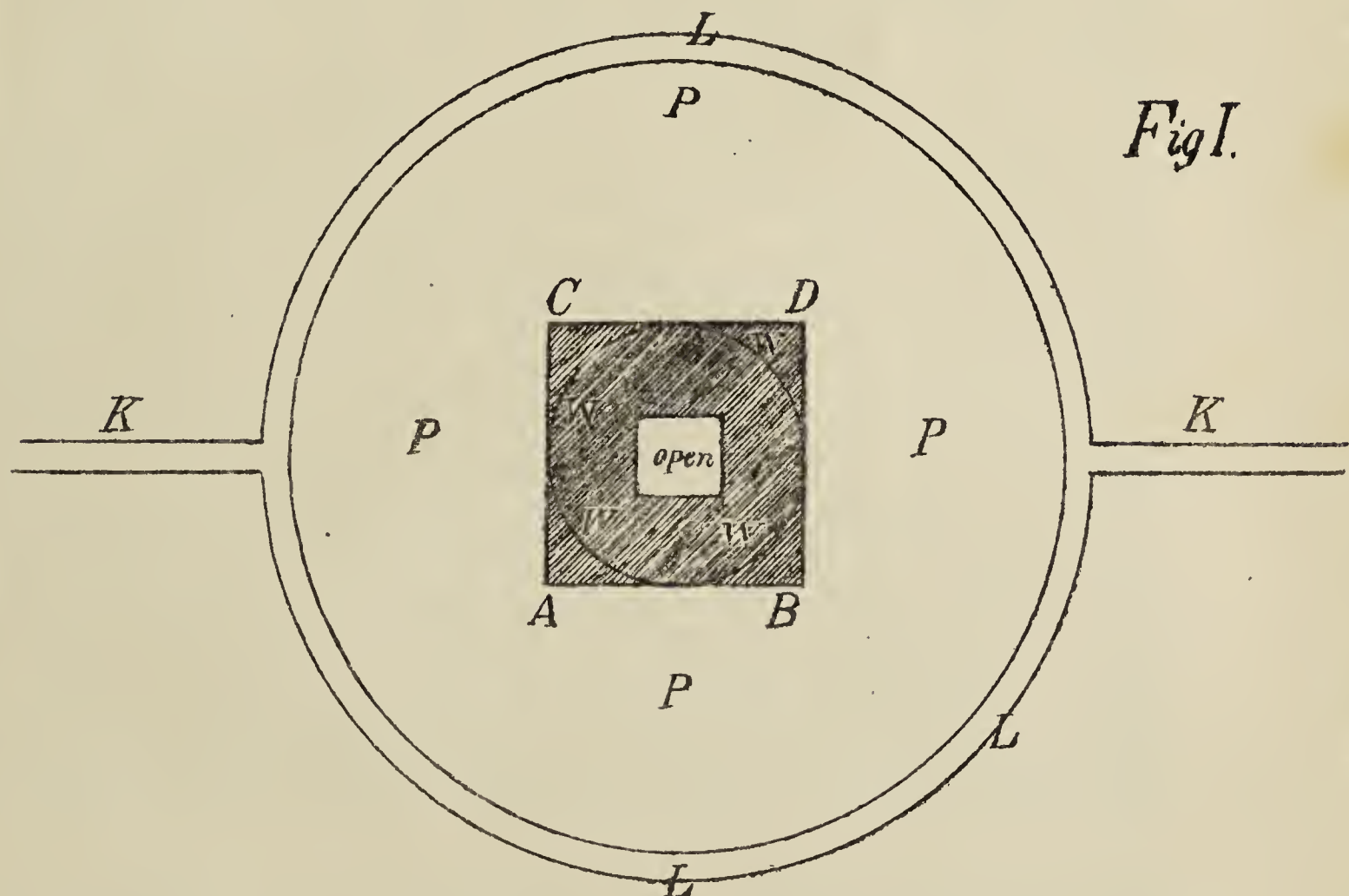


Fig I.

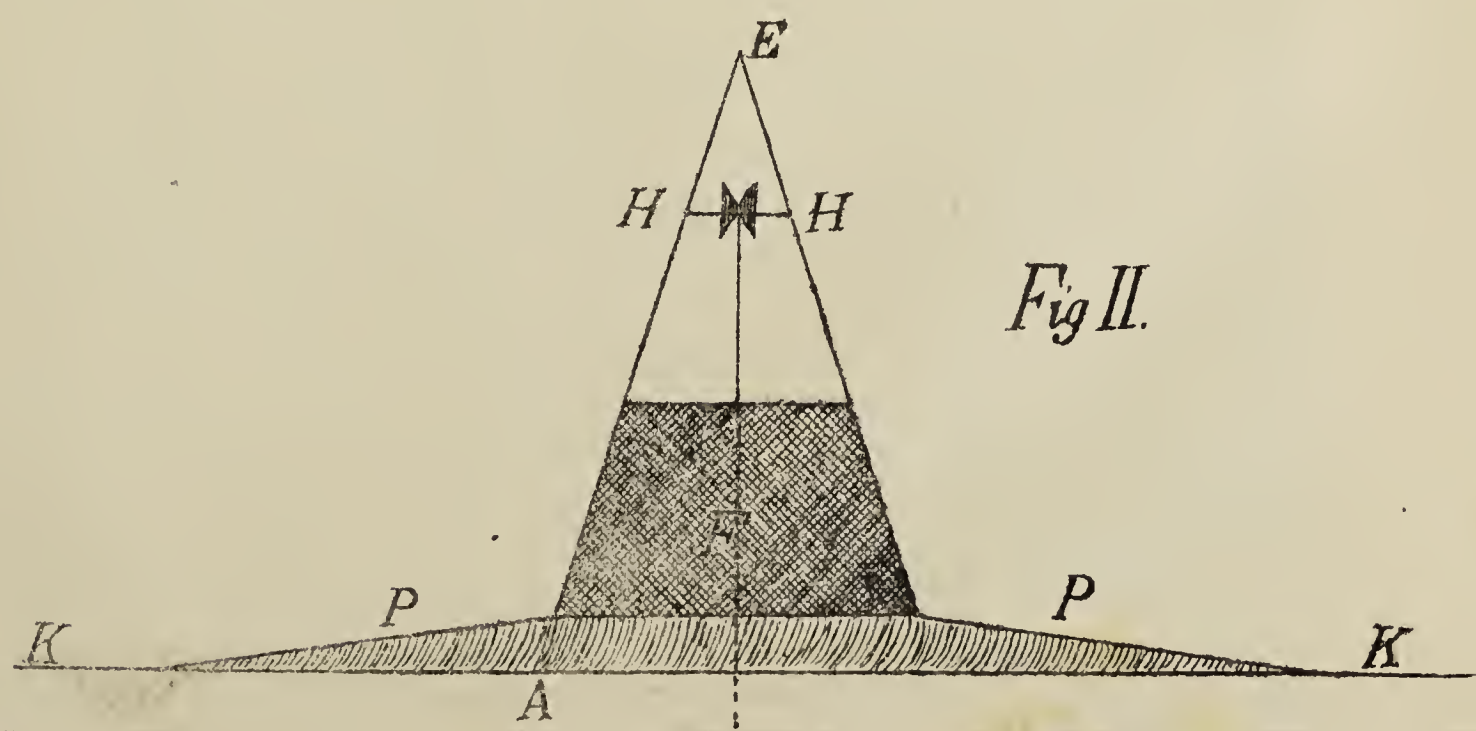


Fig II.

tents. The average depth from the surface to water-level in five wells measured, at different levels was 11' 5."

Latrines.

There are three latrines for females. The two visited were mere spaces of ground enclosed by mud walls in a somewhat dilapidated state.

Cremation and burial grounds.

One cremation ground, two burial grounds, both open spaces at a considerable distance from the town.

Remarks by Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to the remarks made in this report by the Deputy Sanitary Commissioner, Eastern Circle, under the head "chief sanitary defects and suggestions," and that early steps be taken to improve the surface drainage of the town.

JULLUNDUR TOWN AND ITS SUBURBS—Inspected on 19th January 1882 by SURGEON-MAJOR J. BENNETT.

Streets and drains. The main bazárs are metalled and paved with fairly convex surface, and drains on either side. The drains are the most part ill laid and badly kept, their channels in not a few places being somewhat dilapidated and more or less obstructed by silt and debris thrown into them. Near the Jail the bazár drains were seen to be unusually narrow, angular in shape, and of great depth, while their channels in some places were almost completely filled with street sweepings and house refuse. The drains of nearly half the area of the town are flushed twice a day from two Municipal wells constructed for the purpose; at the time of my inspection a free flow of water from these wells was seen to be running. In many of the larger streets the surfaces of the roadways were very irregular and cut up into ruts by wheel traffic, and the side pavements were also much out of repair; in one bazár, in addition to these defects, it was observed that there were no drains of any kind. The smaller streets are paved, but, for the most part, in the old native way with shallow central drains. Comparatively few of the mohallas are paved, and on the surface of the ground are numerous depressions in which the sewage, coming from neighbouring house drains, is allowed to collect. In many places house sinks were seen at the sides of the roadways, considerably under the general level, and unprovided with outlet drains; they were so constructed that it would be impossible to clean them out thoroughly, and when full the contents had to be baled out on the surface. In the interiors of the mohallas filth and house sweepings were seen to be collected in heaps, and private latrines were met with from which fluid filth was issuing and percolating into the soil. These defects were pointed out in the Sanitary Commissioner's Inspection Report on this town for 1878, but little or no improvement seems to have been effected, and I would bring the excellent remedial measures therein suggested to the earnest attention of the Municipal Committee with the view to their being carried out as far as may be practicable. The outlet drain which conducts the sewage of about a third part of the town to a pond at some considerable distance to the south is, before it emerges from the town, of very faulty construction, being little more than a somewhat narrow cut in the earth with the bottom of the channel laid with bricks on edge; outside the town it discharges into a well constructed solid masonry drain leading to the pond above alluded to. This drain being of limited capacity is only sufficient for ordinary wants, and during the rains the streets and roads in this neighbourhood are not unfrequently flooded. On the north side of the town a second system of drains terminates in a large open sewer drain of solid masonry, which carries the sewage and surface water into a deep irregular ditch leading to a large pond adjoining; the channel of this ditch, as well as that of the sewer drain, was a good deal blocked up with filth and street sweepings.

System of sewerage, drainage and conservancy arrangements in force. Round about the city walls are hollows and depressions on the surface, occupied by large ponds into which the drainage of the city and the local floods are received. In 1875 and 1878, during the moonsoon rains, a great part of the country about Jullundur became heavily flooded from excessive rainfall as well as from the influx of flood waters from the north, the ground became waterlogged, and a fatal form of malarious fever became epidemic. The town is now protected to some extent by the construction of embankments some miles to the north, by means of which the flood waters from the "Chos" coming from the Hoshiárpur District are deflected into a large protective drain, made in 1879, and carried by it into the Beyne stream on the west. This drain, which is about 8 miles long, was constructed on the line of an old Sikh drain made many years ago for a similar purpose. The local flooding too has been considerably relieved by the water way through the railway embankment having been increased. The drainage from the east side of the town is carried by the town main drain into a ditch leading towards the Beyne stream; by this channel also the flood waters from the north, together with the spill water from the city ponds, are carried off. On the line of the drain last alluded to, it is proposed, I believe, to carry a large deep cutting from the "Devi Talab," a large pond to the north of the town, to a distance of 6 miles to the south. This cutting, it is said, would drain the ponds dry, and together with the other protective measures already mentioned would, to a great extent, prevent the town and the country round about from being flooded. The undertaking it is supposed would cost Rs. 20,000.

The street sweepings, together with the solid excreta, are removed twice a day, and used by contractors as fuel for their brick kilns. The zamindars are in the habit of collecting filth and house refuse in the courtyards of their houses, and, removing it from time to time to fields, use it as manure.

Water-supply is obtained from 522 wells inside, and 370 outside the town. Specimens of water collected from 11 wells in the town and suburbs were subjected to qualitative analysis. In all these obtained from the town wells, (6 in number,) organic matter in considerable quantity was found, especially in the form of nitrates, which were present in great abundance; chlorides and sulphates were also found in variable quantity. Water obtained from a new well lately sunk by the Municipality for flushing purposes was found to contain sewage salts in great abundance. In March last year, when this well was in process of construction, I examined the formation in which it was being sunk, and found the soil and subsoil, to a depth of about 20 feet, to be chiefly composed of sand and clay with old bricks interspersed, the remains of a former town, and blackened sewage deposit mixed with the soil, the whole giving off a heavy offensive odour. In a specimen of water taken from a well situated at the side of a large cemetery to the north of the town, ammonia was present in considerable quantity, but no other impurities were detected. In the water of two wells in one of the suburbs, "Basti Sheikh," sewage salts were found to be present in large abundance. A standard sample of water obtained from a well in the Commissioner's compound showed the presence of chlorides and sulphates, derived no doubt from the natural salinity of the soil; boiling and filtering the water had no appreciable effect in diminishing the amount of these salts. The tubes of many of the town wells are of faulty construction, and not a few are in a somewhat dilapidated condition, while the sanitary surroundings are, as a rule, anything but satisfactory. The highly contaminated condition of the ground on which Jullundur is built precludes the possibility of obtaining a water-supply unpolluted with the sewage from wells sunk within the intra-mural area; and, although, something might be done to lessen the evil by periodic cleansing by repairing their tubes and cementing the joinings between the bricks to cut off percolation from the impure soil, and by keeping the sanitary surroundings clean and wholesome, the true remedy can only be found in digging wells in clean ground near the skirts of the town. The average depth to the water level in 4 wells measured was found to be 21 feet.

There are 20 latrines, 8 of which are for females. They are built on the ordinary plan, with earthen floors and without roofs. Utensils are provided, but do not appear to be much used, judging from the foul state of the floor of the one examined by me. Sand is used in place of dry earth.

There are two slaughter-houses, one for sheep and goats adjoining the town on the north side, and the other for cattle about 500 yards from the town to the south-west. The former, a space of ground enclosed in high walls, was found to be fairly clean, and the latter is simply a bare open space on the top of an old brick kiln.

There are two cremation grounds, both being at a considerable distance from the city. The one inspected by me was a bare open space situated about a quarter of a mile from the town on the Hoshiarpur road. Close to this is a large burial ground, also an open space of ground, of which but little care seemed to be taken.

Remarks by Sanitary Commissioner. Recommends that a special meeting of the Municipal Committee be convened to consider over the several suggestions made by the Deputy Sanitary Commissioner in this report for the improvement of the sanitary condition of this large and important town, and that whatever steps be taken to obviate the evils complained of this office be informed of the same in due course.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

The insanitary condition of Jullundur, which is nothing more than a Zamindar's Kasbah, cannot be denied, but the Committee diligently endeavours to make such improvements as the funds at their command allow.

This year extensive repairs to the principal side drains are in hand, and the wells will be cleaned. Estimates are being prepared for widening the main drain and for constructing a new drain through the Alluvalla Mohalla.

Increased attention has been paid to cleaning, and I think the condition of the town is, comparatively speaking, satisfactory.

The whole soil is utterly contaminated, but the Committee is of course unable to counteract this work of centuries.

BANGHA TOWN—Inspected on 23rd January 1882, by SURGEON-MAJOR J. BENNETT.

Preliminary remarks. Bangha is a small open town situated on the old Simla road, about 14 miles from Phagwara. It is closely surrounded by cultivated fields, and at each corner is a pond of considerable size, into which the drainage of the streets and lanes finds its way, and there are other depressions in the ground in which water lodges during the greater part of the year.

Streets and drains. The main bazár is a wide open street, with the surface of the road drained towards the centre. The old bazár is a narrow crooked street, with a similarly constructed roadway, the pavement being in very bad repair, and the mid-line gutter is so

completely silted up that in not a few places no traces of it are left. The smaller streets are, as a rule, paved, but the pavement is old and somewhat dilapidated ; and little or no attention appears to be paid to surface cleanliness.

The sewage and drainage of about half the area of the town are carried by a large underground sewer, from near the middle of the town at the end of the "Sanehalu bazár" to the western skirt, where it ends in a ditch leading to a large pond adjoining the town on the west; it runs in the main line of drainage from east to west, and is of sufficient capacity to allow men to enter it, while, along its course, man-holes open into it at frequent intervals. In these holes all kinds of filth, sweepings and house refuse are thrown, which block up the channel of the drain, and together with the contents of street gutters opening into it, convert it into an elongated cesspool; foul smells and noxious effluvia are freely given off, and the drain instead of serving any useful purpose is a positive nuisance to the people living in its neighbourhood, and especially to those occupying the houses under the basements of which its course lies. I was told that, after an unusually heavy fall of rain, the flood waters not finding free exit by this drain, inundate some of the lower lying streets in the middle of the town to a depth of two or three feet. To remedy this state of matters, supposing sufficient funds to be available, I would suggest that a complete series of levels of the different streets be taken, that the roadways which are now under the general level be raised to the requisite height and constructed on the modern plan, with sufficient slope from the middle to capacious saucer-shaped drains at the side in place of the highly objectionable underground sewer, which cannot be kept clean, but is, on the contrary, made a receptacle for all kinds of filth. The open cuts in the ground leading to the large pond above mentioned were in places filled with stagnant sewage in a state of active decomposition, while their channels were, here and there, obstructed with silt. These drains require silting out, and the bottoms of their channels should be protected with some smooth impermeable material, such as rammed clay or *kunker*.

From 31 wells, of which 25 are inside the town. Three samples of water obtained from wells inside the town, and subjected to qualitative analysis, gave indications of serious contamination with sewage, that, obtained from a well situated about 30 feet from the underground sewer previously mentioned, showing the highest degree of pollution. Water drawn from a well situated in a non-polluted area was found to be comparatively pure and whole—some. To obtain a pure water-supply, therefore, it would be necessary to close up the greater number of the town wells, and to sink others in new uncontaminated ground on the outskirts. The average depth from the surface to water-level in three wells measured was found to be $19\frac{1}{2}$ feet.

There are 4 latrines for the women. The one inspected by me was a square piece of ground enclosed by a brick wall about 30 yards distant from the town on the north; the floor, composed of only simple earth, was found to be sodden with urine and covered with excrement, while the field in the immediate vicinity was seen to be in a similarly filthy condition. The other three places used as latrines are only half enclosed, and open to the public road.

There are 4 cremation grounds and 2 cemeteries ; they are mere open spaces, and situated at some considerable distance from inhabited buildings.

The improvements I would recommend are :—Greater attention should be paid to surface cleanliness and conservancy arrangements ; the wells should be cleaned out once, if not twice, a year, and those found to be polluted with sewage to a dangerous degree should be closed, and new wells should be dug in clean ground outside the town ; the level of many of the streets should be raised, and the roadways constructed on the modern plan ; while the underground sewer should be opened out and demolished.

Remarks by Sanitary Commissioner. Recommends that a special meeting of the Municipal Committee be convened for the purpose of carrying out as far as practicable the several suggestions made by the Deputy Sanitary Commissioner for the sanitary improvement of this town.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

There is provision in the budget for paving, and the old bazar will be repaired. Strict orders have been issued against throwing sweepings down the man-holes, which are to be kept closed and only opened by the sweepers for the purpose of cleaning. A series of levels will be taken as suggested. Endeavours will be made to improve the latrines so far as budget provision will allow. An extensive drain to carry off the storm waters is in course of construction.

PHILLOUR TOWN.

Inspected on the 9th November 1882, by SURGEON J. O'NEILL.

Preliminary remarks. This is a small town with little trade, situated on the north bank of the Sutlej on a slightly elevated site. There were once cantonments here, and the bungalows are now mainly occupied by Railway employés. The Fort is close to the town, the intervening space being sandy, and indeed the soil of the country about is to a great extent a mixture of clay and sand. The site of the old Cantonment is well wooded, and on its northern aspect there is a plantation ; a perfect jungle of long grass brushwood and closely grown trees, the great majority of

the latter on account of want of room are badly nourished and prevented from rising by the overhanging branches. This jungle is the favourite latrine of the citizens, as is but too well evidenced when the air is damp and the winds favorable.

The streets are either unpaved or very badly paved with but few exceptions; drains such as exist are almost useless. There is no need, however, to dwell on the state of the streets and drains, for if the Municipal Committee cause the removal of all the filth and dirt deposited in every nallah and secluded place, they will have effected a very great improvement in the town. The streets and lanes had been recently swept that the town might to some extent be presentable, but it would take more than a couple of hours to remove its most objectionable feature.

The system of conservancy said to be in force is as follows:—the sweepers collect the town refuse in heaps, and a contractor takes it away on his donkeys to his kilns. But there is no doubt the contractor takes it just as he pleases, for large quantities of street sweepings were seen in the nallahs.

System of sewerage, drainage and conservancy arrangements in force. From 39 wells; all cleaned in 1881, none in 1882. Water said to be good. There are no tanks.

Water-supply. Latrines. Two for males and three for females. There is no sweeper for the latrines for males, and ordure is thrown into a hollow quite close to the latrines.

Slaughter-houses. There is one beef slaughter-house, and one goat slaughter-house.

Cremation and burial grounds. One cremation and three burial grounds—all open.

Suggests that the attention of the Municipal Committee be drawn to the very unsatisfactory state of the conservancy arrangements of this town. As in most other towns in the Province, the Municipal Committee must take the entire supervision of the conservancy system in their own hands, before any improvement in the sanitary state of the town can be expected. What is at first necessary in this matter is that filth godowns should be erected at a convenient distance outside the town, and the storage of all filth, sweepings, &c., in them insisted upon daily at a convenient hour. The pavement of streets with side drains of saucer-shape, on proper gradients, should be taken in hand. A sweeper should be entertained for the cleanliness of public latrines.

Remarks by Sanitary Commissioner.

JULLUNDUR TOWN—*Inspected on the 29th November 1882, by* SURGEON J. O'NEILL.

At the time of inspection the streets and drains were quite clean. The streets are paved with brick set on edge, and though the old plan of the gutter running down the centre of the street is by no means common, there is a great absence of side drains; some, however, are in course of construction, and care is being taken that the levelling of the new drains is continuous with the main outfall. Adjoining the Dispensary is the remains of an ancient fort, now inhabited by a class called "Arayans." This mohalla is a disgrace to the town, with its tumbled down houses and ruined places used as latrines. It is only by the expenditure of time and money the place can be put in order; anyhow something might be done; the fragments of wall standing might be knocked down and the large heaps of rubbish removed. The condition of this place is in striking contrast with the bazárs of the city, probably, because on account of its isolated position it is seldom or never inspected.

The removal of the refuse of the city is undertaken by a contractor who pays Rs. 600 for the year. The refuse is taken away on donkeys and burnt in kilns or given to the cultivators. For the cleaning of such channels as exist three wells supplied with Persian wheels are set apart. These are worked four or five hours a day, commencing in the morning, and contribute a great deal towards keeping the channels clean.

There are about 500 wells in the city, the supply of water is ample, and I heard no complaints of its quality. Few of the wells are supplied with means of carrying off waste water, and consequently the ground about them is in the great majority of cases muddy. The wells have platforms which offer no impediment to the return of water to the wells. There are three tanks. 127 wells were cleaned during the year.

There are 20 latrines including 8 for females. They are all open; the floor consists of broken sandy soil and they all emit offensive odours. I specially draw attention to one latrine within the city. The householders in its vicinity complain very much of it as a nuisance, and say that in summer time the stench from it is very great, and from my knowledge of the dirty state in which Indian latrines generally are I am sure they say nothing but the truth. When I saw the latrine it was clean. Naturally so. Those people who do not live close to the latrines said it was no nuisance whatever, and that the householders who explained to me did so only because they are in the habit of asking every European who passes that way to help them to get the so-called nuisance removed. There appears to have been a great deal of official correspondence regarding the site of this latrine in the Mohalla Sittan, but nothing has been done, possibly because the

Latrines.

Water-supply.

latrine is a convenience to a greater number than those to whom it is a nuisance. Still, it must be admitted, it is a nuisance and a very offensive one, and I am not aware of any other city in this circle, where there is a public latrine within the walls.

There are two slaughter-houses. The beef slaughter-house is a small enclosure, and as it is insufficiently paved large quantities of blood fall on the earthen floor, where it putrefies. I strongly recommend that a larger portion of this slaughter-house be paved. The one for sheep was quite unpaved. I do not think it could even have been scraped, for, although it looked clean, having been freely sprinkled with sand just before my arrival, it emitted a most abominable stench.

Remarks by Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to the very filthy state of the "Arayins" Mohalla. The Deputy Sanitary Commissioner's suggestion with regard to the public latrine in Mohalla Sithan is just and proper, and recommends that the latrine be closed without further delay. The latrine in question is a long standing nuisance to the inhabitants of the locality in which it is situated. The slaughter-houses both for kine and goats stand in need of pavement.

KARTARPUR TOWN—*Inspected on the 6th December 1882.*

Preliminary remarks.

An unimportant town 9 miles to the west of Jullundur.

A few of the streets are paved and furnished with side-drains, but the great majority of the streets are unpaved. There are many ruined houses in the city, and most of them are used as latrines by the people in their vicinity.

Streets and drains.

System of sewerage, drainage and conservancy arrangement in force.

The dirt is removed by a contractor, who burns it at the brick kilns or gives it to the cultivators.

Water-supply.

The wells are about 60 in number. They have raised platforms but are in no other way protected.

Conservancy Establishment.

Sweepers 16 at Rs. 2-8-0 each per mensem.
Chaprasi 1 at Rs. 5 per mensem.

There is one latrine for females, none for males. Immediately outside the town, between it and the cremation ground, the place is in a very filthy state, the people in large numbers using the ground as a public latrine, the tall grass "sarkanda" affording a convenient privacy. A latrine ought to be constructed near this place and the ground about cleared of "sarkanda" so as to afford no concealment to such a large quantity of filth as now lies scattered about. In the meantime sweepers should be directed to clear the ground as well as the jungle permits.

Latrines.

Slaughter-houses.

There is only one and that is for goats. As the city is nearly altogether a Hindu, one, the consumption of meat is small and no special arrangements for slaughtering are necessary.

The cremation ground is close to the town. The site is probably the one fixed from time immemorial, and it would perhaps be impossible to get another accepted by the people. All around the cremation ground the place is covered with ordure, the long grass "sarkanda" which abounds here gives shelter to those who ease themselves, and a small grove adjoining the cremation ground is very filthy.

Cremation and burial grounds.

In the town there is a manufactory for the preparation of skins. A portion of the process consists in allowing the skins to soak in water till sufficient decomposition has advanced to permit the easy removal of the hairs. At all times of the year this manufactory is highly offensive, especially so in summer, and loudly and constantly have the people complained of it. It ought certainly be removed at once; it is an unmitigated nuisance.

Miscellaneous.

Remarks by Sanitary Commissioner. The Municipal Committee appears to take little or no notice of the conservancy arrangements of its town. Kartárpur has a large establishment of 16 sweepers and one chaprasi, and can be kept clean if only the establishment is under the proper supervision of the members of the Committee. As most of the ruined houses in the town are used as latrines, it is advised to compel the owners to rebuild their houses. If the instructions of the Committee are not carried out within a reasonable time, the houses should be pulled down and levelled to the ground at the expense of the owners. The area between the female latrine and the cremation ground should be at once cleared of the "sarkanda," and the people strictly prohibited from performing offices of nature within Municipal limits. So far as funds permit, the streets should be paved on the plan already adopted in the case of the few paved streets.

The tannery referred to under the head. "Miscellaneous" should be removed somewhere outside the town as soon as possible.

HOSHIARPUR DISTRICT.

HOSHIARPUR AND ITS SUBURBS—*Inspected on the 2nd and 3rd January 1882 by* SURGEON-MAJOR
J. BENNETT, *Deputy Sanitary Commissioner.*

Preliminary remarks.

A topographical description of Hoshiarpur with its suburbs of Khanpur Bahádpur and Bassikhwaja is given in the Sanitary Administration Report for the year 1877.

In the town of Hoshiarpur the main streets are well paved and metalled, with sufficiently capacious open drains, well protected by cement at the sides. Considerable attention appears to be paid to the cleaning of the streets, and the drains, in which the sewage was seen to be flowing freely, are flushed and swept daily. The smaller streets and "mohallas" are, for the most part, paved, many of them having well convexed surfaces with drains on either side, but in some of the narrow streets and passages the pavement is somewhat out of repair and made on the old plan with concave surface and the usual mid-line gutters. It would be advisable to re-pave these streets on the new plan with well cemented side drains in place of the objectionable central gutter, which is so difficult to keep clean.

In Bahádpur and Khanpur the streets, as a rule, are paved in the old style, and the pavement of many of them is old and out of repair, with small inefficient drains, in which the flow of sewage is much retarded by depressions and irregularities in the channels. In Khanpur, the streets are narrow, crooked and dirty, the pavement in a few places, being somewhat dilapidated.

The drainage of about three-fourths of the town is carried by two large open sewers made of solid masonry into the main outfall sewer drain, which terminates at the side of the sandy ravine or "chos" as it is locally named, bounding the town to the north. The main outfall drain, as it passes on to the outlet, is tapped at various places, and a considerable portion of its contents is utilized in irrigating and fertilizing the adjoining fields and gardens. These drains made on a modern scientific plan provide for the outfall of the drainage of a considerable portion of the town in a very efficient way, and the greatest credit is due to the local authorities, who devised and carried out the scheme. A second system of drains on the north side of the town converge into an old underground sewer which discharges into the "chos" immediately outside the walls. A third system on the south side ends in a cut in the earth close to the site of what had until recently been a large pond, (Kila Toba Singh) which used to receive the drainage of this part of the town. Here the sewage stagnates in depressions on the surface to be washed away by the monsoon rains. From this place the natural line of drainage passes towards the adjoining village of Premgarh, which, during the rains, not unfrequently becomes inundated to a depth of two and three feet. When funds are available it would be advisable to provide for a better outfall for the drainage of this part of the town. In the suburban towns of Khanpur and Bahádpur, the sewage and surface water during the monsoon season is carried into the "chos" above alluded to, but in the dry season it is allowed to stagnate on the surface of the ground on the outskirts. In the latter place one of the bazár drains was seen to be discharging its contents on the surface close to the parapet of one of the principal wells, from which a large number of people obtain their water-supply. This unfinished drain should have its channel made continuous with that of the bazár drain on the other side of the parapet, as under the present circumstances, not only is the stagnant sewage a public nuisance, but the well water, in such close proximity to it, is in constant danger of becoming polluted. The sweepings of the streets are removed daily by Municipal sweepers to places set apart for the purpose on the bed of the sandy ravine to the north of the town, whence the stuff is removed by a contractor, to whom it is sold to a brick kiln in the vicinity and there burned. The filth of the public latrines is disposed of by being buried in pits in the ground, and finally sold to zamindars for manure. On the whole the conservancy arrangements in this town are better attended to and more carefully carried out than in any other native town I have visited; and, as has already been pointed out, the drainage of at least three-fourths of the area of the town is very efficiently provided for.

The water-supply of the town and suburbs is obtained from 209 wells of which 175 are inside and 34 outside Municipal limits. Samples of water collected by me from 17 wells, were subjected to qualitative analysis with the following results; of 10 samples obtained from the town wells, 4 showed the presence of chlorides, sulphates and nitrates in considerable quantity; the remaining 7 were comparatively free from these salts, and the water in all respects appeared to be pure and wholesome. The sanitary condition of the wells, the water of which was seen to be contaminated with organic matter, was found to be somewhat unsatisfactory. In one well Misharan Kala, the tube, which appeared to be very old, was covered to a considerable depth with greenish vegetation, and black looking deposits adhering to the joinings between the bricks. In another old, badly conserved well, said to be over 150 years old, situated in a narrow side street, a short distance from the well above-mentioned, and known by the name of "Gurmack Chand ka kua" the water was found to be very brackish, and to contain chlorides, sulphates, nitrates, ammonia in great abundance clearly pointing to a high degree of sewage contamination. As the highly polluted state of this well, cannot but be a source of danger to the health of those obtaining their water-supply from it, it would be advisable to close it up. The mouth of a third, "Daulat Ram ka kua" was seen to be bisected as it were by the wall of an inhabited building, from under the ground floor of which the door of an underground room opened into the tube of the well little above the surface of the water, while, a drain carrying off house

slops, &c. passed close round the foot of the parapet. The whole of the town wells are said to have been cleaned out in September last, when cholera was prevalent, but when inspected by me the sanitary surroundings of many of them were seen to be very defective, and their tubes being for the most part uncemented, afforded access to subsoil drainage, through the joinings, between the bricks. The analysis of a sample of water taken from a well situated in an unpolluted area showed a complete absence of salinity; ammonia was found present, arising probably from the decomposition of dead leaves, which had fallen on the surface of the water from a tree overhanging the open mouth of the tube. In the suburban town of Khanpur, the water of one well out of three examined, "Pir Khanwala," although it had been cleaned out in September, was found to be very much contaminated with organic matter probably of sewage origin. The analysis of the water collected from the other wells of this suburb, as well as of that obtained from three wells in Bahadarpur gave negative results and the water appeared to be pure and wholesome.

The average depth from the surface to the water level was found to be close on 13 feet, the maximum being 14 feet 5 inches and the minimum 10 feet. In Bahadarpur, the average depth to water level was 10 feet 4 inches and in Khanpur it ranged from 5 feet 6 inches, in a well near the bed of the "Cho" above spoken of, to 12 feet 1 inch in the middle of the town.

There are 19 latrines of which 6 are set apart for males and 13 for females. They are simply enclosed places of ground, without roofs and unpaved. Those inspected by me were found to be clean and well kept. As it has been found almost impossible to efficiently carry out the dry-earth system in a town of this size, sand is used as a deodorant. Iron boxes are kept at the latrines for the collection of the filth, which is carted away twice daily and buried in pits at a safe distance from the town.

The slaughter yard for cattle—a space of ground enclosed by a brick built wall—is situated about half a mile from the town to the south-west; the floor is unpaved, but has a raised platform of solid masonry (recently constructed) with a drain over which the animals are slaughtered, and by which the blood is conducted to a receptacle outside the wall. There did not seem to be any proper arrangements for the disposal of the blood and offal, or for having a supply of water to keep the platform clean, and the surface of the adjoining field was in places covered with blood. The offal and sweepings were said to be removed daily by Municipal sweepers, and buried in trenches. Another slaughter yard, for goats and sheep, is situated inside the town; its floor is composed of simple earth with numerous holes and depressions on the surface, into which the blood, garbage and offal of the slaughtered animals are received. The yard is of considerable size and surrounded on almost all sides by inhabited houses: its floor, being somewhat under the general level and unprovided with drains, is said to become very sloppy and muddy during the rains, when the place at all times more or less offensive, becomes a serious public nuisance to the people in the neighbourhood. Blood and animal matters percolate into the soft earthen floor, there to decompose and give off foul effluvia, while the offal is not unfrequently left on the premises until it becomes offensive. This grave sanitary defect can only be remedied by removing the establishments to some convenient place outside the town, at a considerable distance from inhabited buildings. There is another slaughter house for small animals, consisting of two huts with open fronts facing each other, near the suburban town (Khanpur), at about 200 yards distance, with the "Cho" previously spoken of, intervening. The bones and offal are thrown down on an adjacent space of ground, which was seen to be in a very dirty state.

This is a very interesting report. Recommends that it be forwarded to the Deputy Commissioner, and that a special meeting of the Municipal Committee be convened and that the attention of the members be invited to the remarks of the Deputy Sanitary Commissioner, under the head "Chief Sanitary defects and suggestions.

Intimation has now been received that the suggestions made by the Deputy Sanitary Commissioner, in his inspection reports of the towns of Adampur, Phillaur, Jullundur and Kartarpur, have been carried out, as far as practicable, by the members of the Municipal Committee.

(BY DEPUTY SANITARY COMMISSIONER, WESTERN CIRCLE.)

FEROZEPORE DISTRICT.

FEROZEPORE TOWN—*Inspected on 26th December 1882, by SURGEON B. DOYLE.*

A few of the streets have been newly made with side channels. Some of these channels are flushed daily by the water from a well, close to the tahsil. Outside the city wall, a ditch runs along the wall, for a great part of its extent. This ditch receives water from the city drains. The drainage is in part carried into a pool, close to the city walls. The ditch and also the pool are at certain seasons flooded occasionally from the canal. The city water is, in another part, received by a *pucca* channel, outside the walls. This *pucca* channel is continuous with a *kucha* channel or ditch, and the water as it flows along this, is gradually lost in the sandy bed

of the ditch. In another part, the drainage is carried into a pool at some distance from the town, I did not see this pool. I was told that a new drainage scheme was under consideration. The present drainage system outside the walls, is not good. The best system could be ascertained only by knowing before hand the ground levels outside the town.

Fifty one Municipal sweepers are employed inside the city. The city refuse is taken out of the city by zamindars on donkeys. The donkeys and attendants are paid for by the zamindars. The Municipality receives 8 annas a month per donkey load. There are 40, or 50 such zamindars. I was told that the zamindars can remove the stuff, at their own convenience, and that they can dispose of it, as they choose, outside the city.

The town was fairly clean, when I went through it; but around the city, the disadvantages of the present system were more apparent. The stuff from the latrines was not properly disposed of and there were heaps of refuse lying about, in many places.

There are, I was told, about 100 wells inside the city; many of those, which I saw, required proper channels to convey the waste water, to the street channel. In many cases, also the troughs, which form part of the well work, were filled with dirty water, which had been allowed to stand for some time. In some instances this trough water stank from long standing. Some of the wells are partly inside a house or yard, and partly outside. Some of the wells had been cleaned out a few months ago. The water was clear and it is said to be good. I saw no covered well.

There are 7 *kucha* and 7 *pucca* latrines. The *kucha* latrines were in bad order and dirty; dry earth not provided. The stuff was, in those I saw, thrown just outside the latrine, and was not covered. As there are only 11 sweepers for 14 latrines some latrines are without a separate sweeper. I saw one of these, it was dirtier than the others, and had grass, &c., growing inside. Female sweepers are employed on the male as well as the female latrines. Any latrine unprovided with a separate sweeper, should be closed. In the *pucca* latrines, the stuff, which falls into *gumbas*, is removed from the back of the latrine.

There is one slaughter house for sheep and goats. It is an oblong enclosure with mud-walls. There are two small bricked platforms, where the animals are killed. The blood flows along a channel *pucca* at the margin of the platform; it finally is received in an iron vessel. When being skinned, the animals are strung from small wooden triangles. The ground is scooped out, beneath the triangle, and the blood, &c., falls into this hollow in the ground. The soil is very porous; seven bodies were being skinned in this way, at the time of my visit. The blood, &c., is thrown outside, close to the slaughter house, the ground is sandy with tufts of high grass (*Munj*). I was told that the stuff (blood offal, &c.) was buried in trenches, I did not see the trenches, but I saw, couple of uncovered heaps which were partly buried in the loose sand. A bhisti and a sweeper look after the slaughter house. When going through the city, the butchers had their meat exposed for sale, without any protection from flies, which were numerous; I noticed the same thing on a previous date when inspecting the children, who had been vaccinated.

There is a large cremation ground at some distance from the city; this was well kept. There is a new burial ground I was told $\frac{3}{4}$ miles from the city. I did not see this. The old ones, round the city, have been closed by order of the committee.

Remarks by Sanitary Commissioner. Recommends, that this office be furnished with a plan for the new drainage scheme of this town at present under the consideration of the Municipal Committee. It would perhaps be advisable for the Municipal Committee to undertake the monopoly of the town scavenging and sale of filth, &c., to be stored in "khad" godowns at convenient sites outside the town. The wells should all be provided with parapets and waste-water conduits connecting with the nearest street drain. The Municipal Committee should give their early attention to the defects pointed out under the heads of "latrines" and "slaughter yards"

RAWALPINDI DISTRICT.

KALAR VILLAGE—Inspected on the 30th October 1882 by SURGEON B. DOYLE.

Preliminary remarks. Kalar village, Tahsíl Kahuta, was formerly the head-quarter of the Tahsíl. It had also a Dispensary but this has been removed to Kahuta. It is in the unfortunate position of being too small for a Municipality, and too large to be looked on as a village. For sanitary purposes, therefore, some special arrangement is required. Kahuta, which is more like a large village, has the Tahsildar and his officials living on the spot: it likewise has a Dispensary and a District bungalow. It is therefore fairly clean. Kalar has none of these things: it lies over the edge of the tahsíl, and it is very dirty. The town is about midway between Kahuta and Gujar Khan. The main bazár is unusually wide, the ground is of earth, but it is well shaped, being high in the middle, with a drain on either side. The side street are of mud or paved roughly, and without drains. The ground slopes to the North and East. Many houses fell down during the heavy rain, and several of them were being re-built.

At present there is practically no public conservancy arrangement. Formerly, I was told, 5 sweepers and 2 donkeys were paid for at the public expense. Without proper supervision, the mere entertainment of sweepers will not suffice to keep the place clean. Though I believe, the respectable people would aid in promoting conservancy, yet as they have got each his own business to attend to, one man should be paid specially to look after sanitation, and he should be held responsible for this.

There is one well in the middle of the town; water about 40 feet from surface; supply plentiful; water clear and liked by the inhabitants. This well has a parapet, but it has no cover. Another well, which is much used for drinking purposes, is about 80 yards north of the town. As this is on low ground, the water is about 12 feet only from the surface. The water is clean and is said to be good. It has neither parapet nor cover, it is roughly built, and the masonry is loosely put together. I would recommend, that a parapet be built for this well, with a channel to carry off the waste water. There is a third well on the east side on the edge of the town. It has no parapet, but, four logs of wood afford all imperfect protection to the entrance of surface dirt. There were straws, &c., and leaves from a *pipal* close by lying on the water. A fourth well lies at the entrance to the garden, north-east of the town. It is well built; has a raised stone platform, but no parapet. The water is clear, about 16 feet from the surface. There were leaves, &c., lying on the water. There is a tank for bathing purposes on the west side of the town: it is supplied by rain. There is also a *kucha* tank near Baba Khem Singh's house; its surface was covered with leaves, and it did not appear to be much used. On the east side of the town a small stream flows in a wide sandy bed. The water is not used for drinking purposes. A cover with ventilation would of course improve each of these wells; the well north of the town, however, might be much improved, and at a trifling cost, by making a parapet, as suggested above.

The establishment consists of two *mehters* on Rs. 4 each. I found heaps of refuse of all sorts collected in various places, a few of the heaps being inside the court-yards of houses, the others being outside the town, but as a rule, near the houses.

I was told, that the zamindars take the stuff to manure the ground: they do not pay for it, except perhaps under private arrangement. I was told, that the Tahsildar had indicated verbally where the boundary should be for latrine ground, and for throwing manure. As there is no one responsible, and who lives on the spot, these orders have been disregarded. The ground to the south and west of the town is high and level, and laid out in fields. On the east, the small river flows in its wide sandy bed, while to the north and north-east, the ground slopes from the town, and is here cut up by nullahs. This part also is cultivated, wherever, cultivation is practicable. The sandy bed of the river is greatly used for purposes of nature; but all round the town, and in many places close to the houses, the ground is soiled. On the south side, within about 30 yards of the town, there is a broken down oblong enclosure, which I was told, was an old latrine. This was dirty inside. It should be cleaned, and added to the adjoining field. In marking out, or enclosing places for manure stores, it would be advisable not to do this arbitrarily but to consult with the cultivators, who take the manure, so as to arrive at the best practicable arrangement. If the district authorities consulted with the leading men of the town, and with cultivators at the same time, I believe an arrangement, fairly satisfactory to all parties, might be made. The two sweepers, who are now employed I understand, do very little public work. The sweepers and the chaukidars told me that they do not get their pay regularly. They are paid by the lambardar and not directly from the Tahsildar. One of the two *mehters* told me, he had not received pay for a year and a half.

Remarks by Sanitary Commissioner. Recommends, that this report of Dr. Doyle, Deputy Sanitary Commissioner, Western Circle, be forwarded to the Deputy Commissioner, Rawalpindi, for such action as he may deem necessary to take, with the view of determining the best arrangement that can, under the circumstances, be made to place the conservancy of this village, (Kalar) on a satisfactory footing. Suggests that a public meeting of the lambardars and other headmen of the village under the presidency of Baba Khem Singh, C. I. E., be convened at an early date for the selection of a suitable site for the storage of village sweepings, &c., and for the proper cleanliness of the village site. Their attention should also be directed to the necessity of providing the wells alluded to in this report with parapets and waste-water conduits.

JHANG DISTRICT.

JHANG TOWN—Inspected on the 16th November 1882 by SURGEON B. DOYLE.

There is one Municipal Committee for Jhang and Maghiána. Each town, however, has its own conservancy establishment. The ground around Jhang is sandy. By planting grasses, *munj*, &c., and by extension of cultivation, the inconvenience which resulted from the sand has been reduced.

The main streets form a good roadway with *pucca* uncovered side channels. The smaller streets are unprovided with drainage channels. The water finds its way into the sand, outside the town, partly in *pucca* channels, in other places as best it can. The town was very clean at the time of my visit. There were no heaps of rubbish lying about.

There are boundary pillars round the town. The people resort to the waste places outside these pillars for purposes of nature. The town sweepings are sold to a contractor. The sweepings are collected in four places outside the town, and at a sufficient distance. They are here bought by the cultivators, who take the sweepings away, and form them into heaps in places convenient for themselves. The cultivators allow these heaps to lie uncovered by earth, until they become quite rotted and crumbly. They then apply the stuff to the land. There was but little smell from all this. The latrine stuff is carried away into the sandy jungle, and is then thrown into a trench at the places appointed. I was told that the zamindars use this also for their land.

From wells: I was told that there are 32 wells inside the city. Some of these are worked by Municipal bullocks on the Persian-wheel system. At the suggestion of Assistant Surgeon Chetan Shah, Civil Surgeon, a board has been placed between each well and the bullock track, to prevent the bullock's feet from knocking sand, cow-dung, &c, into the water; others are draw-wells; those which I saw have parapets, but no covers. The water is clear and is said to be good. In the draw-wells which I saw there was in each case a certain amount of scum on the surface of the water. Even with a cover the surface would scarcely remain clean in wells within the town. As the water is near enough to the surface, I believe a common pump would be a clean and convenient plan for the people. I do not know, however, what a pump would cost. If the cost were not great, a pump might be laid down in one of the wells and given a trial.

One jamadar, 1 chaprasi, 2 mates, 18 sweepers for city with 18 donkeys; 3 male and 5 female sweepers for latrines; 3 donkeys for male latrines, no donkey for female latrines; 5 bhistis.

Three male and 5 female latrines, oblong enclosure, about 25 yards long, divided by low partitions into square compartments a round boundary well, centre open, dry earth provided at intervals. There is also house for storing dry earth during rain; no pans provided, as it was found that the men would not use them. The compartments are probably less used than the open central space. This is of no importance, except in construction. Female latrines enclosures, without compartments inside, little mounds of dry earth at intervals, means of storing, dry earth. Proposed that part be covered in for rainy weather, where funds permit. Latrines clean at time of my visit.

One outside town for sheep and goats, *pucca* floor, with small channel leading to outside. The washings sink outside into the sand, close to the slaughter-house. This is objectionable and the members of the Committee, who were present, said they would propose to have this altered. The inside was clean, though the characteristic smell was pretty strong. The slaughter-house of all places demands the closest supervision, as any want of cleanliness becomes very objectionable.

The Hindus burn the bodies of their dead on the bank of the Karoraphath river. This is connected with the Chenab and is now dry. Those who can afford it have the ashes brought to the Chenab, those who cannot, bury them in the sand. The Karoraphath runs close to a shady road which connects Jhang with Maghiána. The Muhammadians have an old and large burial ground, a little distance outside the town. The graves are well cared for. There are no wells for drinking close to this burial ground.

This report of Jhang is very satisfactory. The cleanliness of the town and the growing popularity of vaccination are due to the exertions of the Civil Surgeon, Doctor Chetan Shah, Rai Bahadur. Steps should be taken to remedy the defect pointed out by the Deputy Sanitary Commissioner in the slaughter-house.

MAGHIANA-CUM-JHANG TOWN—*Inspected on the 15th November 1882 by* SURGEON B. DOYLE.

Maghiána and Jhang are under one Municipal Committee. There is a separate conservancy establishment for each town.

The streets are mostly unpaved. The chief ones are well made, and are provided with side channels. Two *pucca* channels conduct water out of the town. One opens into the Karoraphath naddi, the second, which is still under construction and nearly finished, leads into low grounds outside the town. This ground is flooded during the rains. Some of the smaller streets are paved and provided with a central channel: the streets were clean.

The system is the same as that detailed in the report of Jhang. There are boundary pillars round the town. One of the manure stores on the south-east of the town appeared to me to be too near the town. The stuff, however, which is collected in these places, is not very offensive, and I was told by the jamadar, that the cultivators take it away before it remains long at the general storing places. The cultivators then make it into smaller heaps and so allow it to remain until it is fit for manure.

There are, I was told, over 30 wells in the town. The water is about 10 or 12 feet from the surface. It is clear, and it is said to be good. In the *Mandi* there is a Persian-wheel, which is worked by Municipal bullocks. There is also a draw-well closeby. I saw several of these wells. They resemble those described in the report of Jhang.

None of the wells which I saw have covers. As stated in my report for Jhang, I believe, the introduction of pumps would, if possible, be desirable so as to exclude surface dirt. If a trial pump should succeed, others might be introduced gradually. As the town does not cover much space many would not be required.

Five male and 5 female—each forming a pair with one house for storing dry earth. Same construction as the Jhang latrines. One latrine which is nearer the town than the others and more used, has two female sweepers in attendance. The male latrine of this pair in addition to its regular sweeper receives part of the service of one of the city sweepers. I visited the 10 latrines and found them clean.

Ono for cattle, some distance from the town. This is licensed to one man, who is expected to keep it clean. Ono for sheep and goats, this is nearer the town. These are small unroofed enclosures, floors *pucca*, with channel leading through wall to outside. The first one is not much used. The slaughter-house for goats, &c., is rather too close to one of the manure stores. The washings of the yard which flow out along the channel sink into the ground outside the wall. This is objectionable. I was told, that this would be considered by the Committee.

In the town, I saw three or four men with meat for sale. They were in the street. Two of these men had their meat exposed to the sun and what meat was uncovered by a cloth was covered with flies. It would be well to have some shelter for the meat, and, while this was being provided, the butchers should be directed to shift their meat when necessary, so as to keep it in the shade. The members, whom I saw said they would make a proposal about this matter.

Cremation and burial grounds. The Hindus are burnt on the margin of the Karoraphath naddi. The Muhammadans are buried some distance from the town.

Remarks by Sanitary Commissioner. This report is satisfactory. Recommends that arrangements be made to remedy the defects pointed out in the slaughter-yard.

Summary of Inspection Reports of Civil Surgeons. 60. I give herewith also a summary of the Inspection Reports of 15 principal towns visited by Civil Surgeons during the year 1882, as per list noted below:

List of large Municipal towns in the Punjab inspected by the Civil Surgeons in the year 1882.

No.	DISTRICT.	TOWN.	Name of Civil Surgeon or Inspecting Officer.
1	DELHI ...	Sonepat ...	Surgeon-Major G. C. Ross, Civil Surgeon.
2	GURGAON ...	Rewari ...	Hon. Surgeon R. E. Wrafter, do.
3		Palwal ...	Assistant Surgeon Gokal Chand.
4		Kaithal ...	Surgeon G. W. P. Dennys.
5	KARNAL ...	Panipat ...	Ditto ditto.
6		Umballa City ...	Surgeon A. E. R. Stephen, offg. Civil Surgn.
7		Jagadhri ...	
8	UMBALLA ...	Shahabad ...	
9		Sadhaura ...	
10	HOSHIARPUR ...	Tanda and Urmars ...	Hon.-Surgeon C. L. Fox, Civil Surgeon.
11	LAHORE ...	Kasur ...	Assistant Surgeon Gokal Chand.
12	GUJRANWALA ...	Wazirabad ...	Hon. Surg.-Maj. R. J. Quinnell M.D., Civil Surgn.
13	RAWALPINDI ...	Rawalpindi ...	Assistant Surgeon Fattah Chand.
14	GUJRAT ...	Jalalpur ...	Surgeon-Major J. R. Deane, Civil Surgeon.
15	JHANG ...	Chiniot ...	Assistant Surgeon Chetan Shah, offg. do.

Summary of Inspection Reports of Municipal Towns, received from Civil Surgeons, from 1st January to 31st December 1882.

DELHI DISTRICT.

SONEPAT TOWN—Inspected on 26th January 1882.

Preliminary remarks. Sonepat is an extremely ancient site, the present town being built on the mounds and ruins of former cities. The first was erected by Raja Sun Chohun, some 2,700 years ago.

The streets are nearly all *kucha* and without side drains. The small streets are very dirty from people easing themselves in them, and from drainage from the houses. There is no system of drainage and the streets should be made *pucca* and have side drains constructed. The *pucca* drains that there are, are never flushed, as there are no *bhistis*. Rs. 3,000 are to be spent on *pucca* roads.

Private houses are swept by *bhangis* (sweepers) under private arrangements, and the night-soil sold by them to proprietors of brick kilns; or else deposited outside the town in places fixed upon by the Municipality.

Water from the wells, and is good in 4 of them outside the town. The wells inside are brackish and not much used for drinking purposes, except, by the poor.

There are 4 *kucha* latrines outside the city, which are to be renewed and built *pucca* at a cost of Rs. 206 each, 4 latrines is an allowance of one per 3,250. Very much too few. The latrines are not kept clean for want of proper arrangements.

Remarks by Sanitary Commissioner. Recommends that this report be forwarded to Deputy Commissioner for information.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

In Sonapat the Municipal Committee are intelligent and have recently taken much interest in Municipal affairs. Two of the members also are Honorary Magistrates and constitute a Board having the powers of a Magistrate, 3rd Class, for enforcing bye-laws.

The tahsíl also is in the town, and Municipal improvements, are carried out under the eye of the Tahsildar.

The difficulty in Sonapat has hitherto been want of money; but in the last two years, owing to the improved supervision of the members, the income has risen from Rs. 6,700 to about Rs. 9,000 annually, and more money has recently become available for works of improvement. During the last 3 years Rs. 5,865 have been spent in paving and draining the streets, and the money, which the Civil Surgeon observes, is to be spent on *pucca* roads, is really to be expended on improving the streets of the town. Every thing necessary cannot, of course, be done at once, and the Committee can only do so much as their funds will allow. Satisfactory progress has, however, been made in recent years, and should the Municipal income continue good more improvements may be anticipated. In November, 1880, the Sanitary Primers were distributed as follows:—

One copy to each minor Municipal Committee, one to each Non-official Member of the District Committee, one to each Tahsildar and 6 to the Civil Surgeon.

GURGAON DISTRICT.

PALWAL TOWN—*Inspected on the 4th February 1882.*

Palwal is an old town, and is situated on an uneven surface at a distance of 30 miles, south-west of Gurgaon and 36 miles south of Delhi. It is a walled town, and is inhabited by Hindus and Muhammadans of all castes. Hindus predominating.

There is no system of sewerage or drainage. The conservancy arrangements are attended to by members of the Municipal Committee. The town is divided into circles, and members are held responsible for the general cleanliness of their own divisions. The city Inspector, Sharajat Ali, most attentively looks after the sanitation of the town, and the whole is superintended, and most prudently managed by the Tahsildar, Babu Jugal Kishor.

There are 22 wells within the town-wall and 6 only in the surroundings, but not very far from the town. All supply sweet and wholesome water except two, both of these being saline. The supply is ample.

This consists of 22 sweepers: of these, there are 6 females, all on Rs. 3 a month, and an Inspector, on Rs. 10 a month. The latter is a very hardworking man, and takes great interest in his work.

Latrines. Six latrines—2 *pucca* and 4 *kucha*. They are kept very clean, and the dry earth system is carried out.

There is a *kucha* compound outside the city wall, in which kine, as well as goats and sheep are killed. In my last visit, I brought to the notice of the Tahsildar, that it was most objectionable to slaughter goats and sheep in the same place with kine, and since then the kine are slaughtered in the compound, and sheep and goats at another open spot, and it is being proposed now to make two separate slaughter-houses not very near to each other.

Cremation and burial grounds.

Cremation and burial grounds are both out of Municipal limits.

Miscellaneous. Towards the north there is a small *jhil*, which receives rain water of the surrounding area. The water remains lodged in this place a month or two after rains have ceased.

Remarks by Sanitary Commissioner. Recommends that this report be forwarded to the Deputy Commissioner, for information and that the exertions of the Tahsildar, Jugal Kishor, in furthering the cause of vaccination and sanitation be brought prominently to the notice of the Municipal Committee.

REWARI TOWN—Inspected on the 12th March 1882.

Preliminary remarks. The town is situated on low ground, soil is loose, porous and very dry, not amply shaded by trees and plants, and has a natural slope towards west and south. The Rajputana-Malwa State Railway runs close by the western part of the town, which is surrounded by a mud wall, for Octroi collection.

Streets and drains. The roads through bazár are metalled and have drains on each side. Besides these there are 3 or 4 roads (paved and metalled), which pass through mohallas. The remaining streets in mohallas are *kucha* and tortuous. The drains are open ones and are mere outlets for water during the rains. The roads, streets and drains are kept regularly swept.

System of sewerage, drainage and conservancy arrangements in force. There are no public sewers. The liquid sewage, &c. from houses is received into reservoirs (*pucca*) from which it is daily taken out and carried away in *gharas* to be sprinkled over open grounds by sweepers in private employ of the householders. The mode of disposing off sewage from houses is difficult and cannot be expected to be efficiently carried out.

Water-supply. There are about 60 wells inside the town, all being brackish and unfit for drinking, and about 30 inside the town, which supply water for drinking. There are three tanks, 2 of which are *pucca* masonry reservoirs, one situated near the Serai and Railway Station and another about High School. The *kucha* one is situated at some distance from the town and the water of it appears superior in quality to the two others, which have water covered over with a green scum of vegetation. These tanks are used for bathing as well as for washing cattle. They have not been cleaned out for years.

Conservancy establishment. The establishment consists of one Conservancy Daroga, on Rs. 15 per mensem and 62 sweepers and 4 sweepresses at Rs. 3 per mensem, excepting 4 sweepers @ Rs. 4, who are attached to the latrines for males, and 9 more sweepers, who are conservancy cart drivers, @ Rs. 8 each per mensem. The whole establishment works under the superintendence of Assistant Surgeon Kali Nath Rai, who gets an allowance of Rs. 30 per mensem for the work.

Latrines. There are 8 *pucca* latrines, 4 for women and 4 for men, all situated at convenient distances round about the town. These are thatched *kucha-pucca* constructions, double blocks: the latrines for women are excellent designs, but those for men are faulty in respect of light: the entrance into each of the cells or compartments being too narrow to allow a stout man to pass through without rubbing against the walls. The ordure from the latrines is carried to *kuris* (filth depôts) by means of carts and baskets. The dry-earth system is in force and *gumlas* are used to catch the fæces. The refuse is sold occasionally as manure at a small cost.

Slaughter-houses. There are 2 slaughter-yards, enclosed by walls, made of *kucha* bricks with *pucca* copings or tops. One is used for kine and the other for goats and sheep, that for kine is situated at some distance from the one used for goats and sheep, both being outside the town.

Cremation and burial grounds. There are 4 cremation grounds situated round about the town enclosed by walls of *kucha* bricks with *pucca* tops. There are no fixed enclosures for burial. The people sometimes bury their dead in their own grounds.

Miscellaneous. The brick kilns, pottery and tannery are all situated outside the town.

Remarks by Sanitary Commissioner. Recommends that a special meeting of the Municipal Committee be convened for the purpose of carrying out, as far as practicable, the several suggestions made by the Civil Surgeon for the sanitary improvement of this town.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

The Deputy Commissioner has consulted the Civil Surgeon and Municipal Committee, and is taking such steps as seem practicable towards remedying the defects complained of.

KARNAL DISTRICT.

PANIPAT TOWN—*Inspected on 5th May 1882.*

Panipat is situated $21\frac{1}{2}$ miles south of Karnál and on the Grand Trunk Road, between Karnál and Delhi. The city is built on slightly elevated ground above the adjoining country. During the months of August and September last year cholera prevailed in the city of Panipat as an epidemic, there being a total of 114 deaths recorded as due to the disease, whereas, not a single case occurred at Karnál. A thorough sanitary inspection of Panipat is of great importance and every step taken to remove all causes which are likely to cause a repetition of the epidemic. Great improvements have been made in the city, during the last year or so, but there still remains cause for complaint.

Preliminary remarks. All the principal streets have been metalled during the last year, and thoroughly good *pucca* drains about $1\frac{1}{2}$ feet broad and one foot deep have been made on either side and as the city is built on elevated ground, there is a ready exit for all rain and other water collected in these drains. There are, however, several of the smaller streets which have no such drains, and in some of these, water from wells and other sources, is allowed to trickle slowly down the middle of the streets and stagnate there. In some of these streets there have been drains, which are, however, now completely out of repair, and not of the slightest use. All the streets of the city are very narrow, but not more so perhaps than in most other native towns. The streets were as a whole kept very fairly clean and in good order.

General description and present state of streets and drains. Water from the drains is carried into the nearest cultivated fields, around the city. There are altogether 4 manure stores in which the whole of the filth of every kind from the city including that from the latrines is deposited. These manure heaps are situated as follows: *viz*:—one north-east (which is less than $\frac{1}{2}$ a mile from the city), one east, one south and one west. These places are used also for depositing the carcasses of dead animals, and, when the place was inspected, there was a north-east wind blowing which carried the stench from the first named heap directly on to the town. Another objection to the heap in the north-east is that, it is placed in close proximity to the main road to the village of Barsat and upon which there is a considerable amount of traffic. It would be advisable to have this manure heap removed, not only much further away from the city, but also placed at some considerable distance from the Barsat Road. Fæcal matter, &c., from latrines should not be thrown on these manure heaps, but should be properly deposited in trenches and these should be filled from time to time with dry earth. Carcasses of dead animals should also not be thrown on the manure heaps, but be either buried or removed much further away from the town. It is not necessary to have so many manure heaps placed on all sides of the city as at present exist. Two would be quite enough and would not give the sweepers very much extra work to remove all filth to one of these two heaps. There are two or three wells in close proximity to the first named manure heap: the waters of which are used for drinking purposes.

System of sewerage, drainage and conservancy arrangements in force. There are 136 wells within Municipal limits. Two *pucca* and one *kucha* tanks just outside Municipal limits. These all dry up in hot weather—one *pucca* tank was well cleaned out about 4 years ago. 78 wells were cleaned out last year. 55 wells are used for drinking purposes—81 for washing, &c., level of ground water about 28 feet from surface—about 9 feet of water in each well. Supply of water is ample for the requirements. In many places outside the city, the water was allowed to stagnate around the wells, but at the recommendation of the Surgeon-General, Punjab, in his last inspection, steps have been taken to carry the water off by surface drains into the nearest cultivated fields.

Water-supply. There are four public latrines made of brick masonry, each containing 4 compartments—of these two are exclusively for use of women and two for men. They are supplied with iron pans and worked on the dry-earth system. Two are situated on the south of the city and two on the west side—about 100 or 200 yards outside city walls. One sweeper is posted to every two latrines. All filth from the latrines is deposited in some of the manure heaps mentioned above. This is afterwards sold as manure by the sweepers for their own benefit. The public latrines are kept in good order. There are several private latrines in the city. Filth from these is disposed of as above. The public latrines are not very popular being used principally by the lowest castes.

Latrines. The Municipality derives no income by the sale of manure. The manure is considered the property of the sweepers, and is sold by them to cultivators.

Slaughter-houses. One large *pucca* slaughter-house north of city; kept in very good order. Three *kucha* slaughter-houses one in east, one south, one west of city. The ground of these is occasionally scraped and removed. Disposal of offal, blood, &c. same as for latrines.

Cremation and burial grounds. There are three cremation grounds—one south, one north and one east. All more than one mile from city. Burial grounds 115. A large number of these are not in use. Several are within the city, but are not used now. The grounds now in use are fairly kept, but are not enclosed by any wall, hedge or other means.

Requests, that the attention of the Municipal authorities may be invited to the several suggestions made in this report by the Civil Surgeon, for the sanitary improvement of this town. Particular attention should be paid to the several remarks and suggestions made by Dr. Dennys under the head of "chief sanitary defects and suggestions," except that there is no necessity to provide separately for the disposal of latrine ordure and carcasses. It is preferable that all town filth, of whatever kind, should be deposited in the filth or manure godowns.

KAITHAL TOWN—Inspected on the 23rd May 1882.

Preliminary remarks. The city is built on elevated ground from which there is good natural drainage on all sides. The soil in many places near Kaithal contains a large amount of nitrate of potash, and there are nine manufactories of this salt around the city. The water of wells in close proximity to these manufactories is said to be undrinkable causing dyspepsia and diarrhæa. The country around Kaithal, for the most part, consists of jungle principally of *Dhak or palas*. The climate as a whole is considered to be warmer than that of Karnál, but there is never much fever at Kaithal, and the inhabitants as a rule seem a well nourished and healthy set of people.

General description and present state of streets and drains. The City of Kaithal itself leaves little to be desired. The streets are kept very clean, and in good order, and are broader than one generally sees in native towns. All the main streets are provided with *pucca* brick drains on either side from a foot to 2 feet broad, and about a foot deep. The drainage of the town is very satisfactory as a whole. In one place only it was found that the fall was not good and during excessive rain the road adjacent to the drains becomes submerged. I recommended that the drain now existing should be dug deeper and broader, especially at the lower end where it passes under the city walls so as to give the water a better fall and quicker exit.

System of sewerage, drainage and conservancy arrangements in force. Water from city is carried into nearest fields. In several places outside the city arrangements for carrying off water is very imperfect, and in some parts during the rains the water stagnates in large quantities. There are 4 manure heaps, *viz.*: one north, one north-west, one south and one south-east. The whole of the city filth, including that from latrines, is deposited in some one of these heaps. Most of these heaps are within $\frac{1}{4}$ mile of city. It would of course be better, if practicable, that filth from latrines be not deposited in these heaps so close to the city, but, that it be buried in trenches at some distance from the town, and these trenches be filled in from time to time with dry earth.

Water-supply. Wells inside city 26, outside 27, water of all is drinkable. Outside wells used also for cultivation. Ground water level in the east side about 90 feet from surface, and about 15 feet of water in most of the wells at this time of year. In west of city ground water is about 120 feet from surface, and about 30 feet of water in each well. Four wells inside the city were cleaned out last year, water is of good quality, and plentiful; water of wells near nitrate of potash manufactories not drinkable. Tanks 11, two *pucca* and nine partly *pucca*, in Municipal limits; one *pucca* tank repaired last year. Some of the tanks have not been cleaned out for 10 or 12 years, and are in a disgraceful state: several feet of filthy mud at the bottom, and at this season of the year, when water is very low, the smell from some of them is fearful, especially from the Bikidar Tank, the largest, which has not been cleaned out for 12 years, and which is situated immediately under the Dak bungalow. The tank used for bathing purposes by the women is sadly in want of repairs. There is no river or canal within 10 miles of Kaithal.

Latrines. Four latrines (public), one north, one south, one east and one west. These are in a disgraceful condition, situated short distances outside the city walls. No special sweepers allotted for them, no *gumlas*; no dry earth. The ground saturated with urine and fæcal matter and the stench is fearful. The city sweepers are supposed to visit every day and clean them out, but the Inspector reports, that they are usually left 3 or 4 days without being touched and then cleaned out very imperfectly. The buildings are also tumbling to pieces, and unless repaired and properly supplied with *gumlas*, dry earth, and a sweeper portioned off expressly for each latrine they had much better be completely destroyed and not used at all. There are several private latrines. These are kept in good order and worked on the dry-earth system.

Income derived from sale of manure. The manure is not turned to any account whatever, cultivators refuse to buy it from Municipalities, so it is allowed to remain where it is thrown. It is not the custom here to manure the fields and the few who do so, do not care to buy manure.

Slaughter-houses. Two slaughter-houses, *viz.*, north-west and one west. They are small walled enclosures. In one there is a small *pucca* drain to carry off blood, &c. The animals are killed on the ground, and no trouble taken to remove the earth periodically, which is found saturated for a depth of several inches with decomposing blood, &c., and the smell was most offensive.

Cremation and burial grounds. Six cremation grounds not enclosed; 2 north, 1 west, 2 south, 1 south-west. Twenty-one burial grounds outside, *viz.*, 4 east, 3 north, 2 north-west, 1 south-west, 5 south, 5 south-east. One European burial ground lies within 150 yards of the city wall: fairly well kept; about 5 are enclosed by walls. None within city.

Requests that the attention of Municipal authorities may be invited to the several suggestions made in this report by the Civil Surgeon, for the Sanitary improvements of this town under the head of "Chief Sanitary defects and suggestions."

Remarks by the Sanitary Commissioner.

UMBALLA DIVISION.

JAGADHRI TOWN—*Inspected on the 21st May 1882.*

Since the last inspection on 11th May, there have been three cases of cholera reported, two in the town and one in a village, Bhatli, one mile from the town; the last proved fatal. It was thought desirable to make another inspection in order to see what was the present sanitary condition of the town, and how much of my suggestions made on the first visit had been carried out.

Preliminary remarks.

The streets and drains generally were much cleaner than on my last visit. Three vaccinators have been hard at work there under my orders and under the immediate supervision of the Assistant Surgeon on sanitary matters. There are some stagnant, ill-smelling, drains outside one of the gates of the city, which were at once brought to the notice of the Municipal Committee. Human excreta were less frequently seen in the slums of the city than on the last inspection. The smaller drains inside the city were in better condition, but some *kucha* ones were still filthy and required digging up. All these *kucha* drains should be dug up twice a week and the results (*sic*) at once taken and buried outside the city.

General description and present state of streets and drains.

The solid refuse is taken away by *meheters*. The liquid goes into the big drains leading outside the city. These big drains at last empty them selves into tanks at some distance from the city. Since my first visit, the big drain of the city, has according to my directions, been dug up and all its filth removed; it is now quite odourless. Town filth is used partly as manure, some is used by the brick-makers as fuel.

System of sewerage, drainage and conservancy arrangements in force.

From wells. The wells are kept clean and the water is clean and sweet. The insanitary conditions of the surroundings of the big well mentioned in my last report have been rectified.

Water-supply.

Outside the city. *Gumlas* and dry earth ordure is taken away and buried in appointed places. For private latrines in the houses, earth is used to cover the ordure at the time, which is removed twice a day by the sweepers.

Latrines.

No income is derived from the sale of manure, I believe; I noticed much human ordure in some of the dry sewage canals, outside the city, the result will be that in the rains, this human filth will be washed down into neighbouring tanks and there stagnate and stink.

One slaughter house half a mile away from the town outside the Booria gate.

Slaughter-houses.

Hindus burn their dead near the tanks outside the city. The Mussalman burial ground is a quarter of mile outside the city.

Cremation and burial grounds.

Requests that the attention of the Municipal authorities may be invited to the several suggestions made in this report by the Civil Surgeon for the sanitary improvement of this town, and particularly referred to in this office No. 1520, dated 5th June 1882.

Remarks by Sanitary Commissioner.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

The Civil Surgeon's suggestions were approved by the Deputy Commissioner, and orders were issued to carry them out. The work of clearing drains was in progress.

UMBALLA DISTRICT.

UMBALLA CITY—*Inspected on the 7th and 9th June 1882.*

The city is about half a mile square, most of the houses are built of *pucca* brick.

Preliminary remarks.

The streets and drains were very fairly clean. The house drainage is carried out by a system of *chubachas*. On the mornings, I visited the city, these were nearly all empty. I met sweepers with *pakhals* carried by buffaloes, who were employed in emptying these; this is done night and morning. The streets and drains were in a satisfactory condition.

Streets and drains.

Carried away night and morning by the *meheters*, in *pakhals*, thrown outside the city on the field and dug up every day.

System of sewerage, drainage and conservancy arrangements in force.

Entirely from wells on the south-east side of the city, near the Hospital and Municipal Hall. The water is good, but gets very scarce in the hot weather and becomes muddy on account of its being shallow. At present there is such a scarcity of water, that most of the wells become dry by night time. Many of these wells are situated too near to the margin of the big bathing tank opposite the Hospital, called Naurang Roy's Tank.

The latrines are in a very satisfactory condition; they are situated outside the city on its four sides from 100 to 400 yards from its margin. In each position, there are two blocks, one for males, the other for females. These are built of *kucha* brick and plastered, and were all quite clean on my visit. There are no *gumlas* in the latrine set apart for *mehters*; this should be remedied. The only dirty and ill-kept latrines in the city were those of the Government and Missionary Schools, at the latter no *gumlas*, those existing at the former are not used.

There are two. Only one was inspected, the other was, unfortunately, forgotten at the time. The one inspected was clean and in good condition, but a *chabutra* should be made for putting the dead animals on whilst they are being skinned; at present they are put on the ground.

Cremation and burial grounds. All in a satisfactory condition.

On the southern aspect of the city, abutting on to the walls of the compounds and houses on the outside of the city themselves, are two lime kilns belonging to a man named Thakur. The inhabitants near complain of intense discomfort when lime is being burnt, they declare it very irritating to the eyes and gives them headaches. Coal is also burnt with the lime. One man stated that they are a source of danger, also, as sparks fly about from them, and at any time a stray one or two might ignite inflammable dry substances in and about their houses.

Requests that the attention of the Municipal Committee be invited to the remarks of the Civil Surgeon under the head of "Latrines," "Slaughter-houses" and "Miscellaneous."

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

Orders have been issued to remedy the defects pointed out therein, regarding slaughter-houses lime kilns, and latrines at the Government and Missionary Schools.

SHAHABAD TOWN—Inspected on the 30th June 1882.

The town is dirty, but not so bad, as I was led to expect from the previous reports. A vaccinator had been residing in the town for 15 days before my inspection, for sanitary purposes, and probably by his efforts the town was improved. The "Khatiks" now wash their leather in pools outside the city. Many of these pools want cleaning.

In the Maniarian Street, the drain in the middle was very bad. It was choked up in places by a collection of half solid and half fluid black filth, this could be remedied by having it dug up in those places where it was *kucha*, and this was ordered. Many drains leading from private houses were very dirty, and choked up with the same sort of filth above described, they were all ordered to be dug out at once. Most of the *chubachas* were full, but I visited very early in the morning, and during the latter part of my visit there was rain which helped to fill them.

The drainage is removed daily by *mehters* through *pakhals*. In the middle of each big street there is a drain where it is *pucca*, it is kept fairly clean, but where street filth generally stagnated. *Chubachas* received the drainage and sewage of the houses; they are emptied daily.

From wells: there were stated to be 108 in the city. Those I examined had from 4 or 5 feet of water, and were of a depth of from 24 to 38 feet. The water was clear and sweet. But the immediate surroundings of many of the wells left much to be desired. Round the blacksmith's well near the *Musjid*, the ground was a complete swamp consisting of half fluid, half solid black filth, and extending, on one side about 12 yards. This swamp is greatly caused by the drainage of a public, "*gusalkhana*" (bathing place) placed near the mouth of the well. All this swampy ground was ordered to be dug up. The ground around the mouths of some of the other wells was in a similar condition.

Very ill kept, just outside the city, near the high road. The men's latrine is close to the women's: there were no *gumlas* in either; and only in the men's were there any partitions. When I visited them, I found excreta scattered all over the ground indiscriminately and also behind the latrines themselves on a big rubbish heap, which itself was a perfect latrine. The Tahsildar promised to get *gumlas* for the latrines; to build partitions in the women's latrine, and to provide a door, for the sake of decency, for the women's latrine.

Slaughter-houses. There are none.

Two cremation grounds, one on the Markanda River, and one on the Devi Tal (Tank). There are 32 burial grounds at various distances outside the city.

The main defects to be noticed are:—(1) The filthy condition of the ground about the wells, the blacksmith's, lower school and blue dyer's well being particularly bad. (2) The house drainage. (3) The latrines and the ground near, scattered with excreta.

Remarks by the Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to the remarks of the Civil Surgeon on the state of their town, with the view to their adopting measures, in consultation with the Civil Surgeon, to remedy the defects pointed out. No statement is given of the income derived from the sale of manure in this report. The wells referred to by the Civil Surgeon should be periodically cleaned out and their surroundings thoroughly kept clean. They should also be provided with parapets and waste-water conduits to the nearest street gutter. The town drainage should be taken into consideration at an early date. The street gutters, &c., should all empty into an intercepting drain round the outskirts of the town for the reception of the town sewage.

Recommends that the remarks and suggestions of the Civil Surgeon, under the head of "Latrines" may receive the early and earnest attention of the Municipal Committee.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

The suggestion made regarding the state of ground around the blacksmith's and two other wells, has been attended to.

SADHAURA TOWN—Inspected on the 11th July 1882.

Preliminary remarks. Town is very irregularly built, the streets narrow and winding. Situated near the hills on the banks of a tributary of the Markanda River. The town was not disgracefully dirty, some of the drains were choked up, but the *chubachas* seemed to be kept empty.

Streets and drains. The main bazár is very narrow, is floored with *pucca* brick. Down the centre of it is an open drain which appeared fairly clean, but there had been rain just before my inspection.

System of sewerage, drainage and conservancy arrangements in force. The house drainage empties itself into neighbouring *chubachas*: most of these seemed to be kept in a good state of freedom from being blocked up by half solid filth. Some of the drains, however, leading from the houses were choked up with thick filth, this was ordered to be removed and the drains, where *kucha*, were ordered to be dug out.

Water-supply. There are about 50 wells in the city. The water examined was fairly clean and sweet to the taste. There were about five feet of water in the wells. I noticed, in this town, that the ground about the mouths of the wells was not swampy nor consisting of black looking half solid filth, as is the case in other Municipal towns I have inspected in this district.

Latrines. The latrines are outside the city, the one for males being a long way from the one for females. The latrines have no *gumlas*. The men's latrine was very clean. I did not inspect the women's as it was a very long way off, and I found the men's one in a good state.

Slaughter-houses. There is only one slaughter-house as yet. It is situated outside the city.

Cremation and burial grounds. There are four burial grounds and three cremation grounds all situated outside the city.

Remarks by Sanitary Commissioner. Recommends that the attention of the Municipal Committee be invited to the faulty state of their street drainage, with the view to the preparation of a plan and estimate for a comprehensive system of sewerage by open surface gutters at the sides of the streets so as to do away with the present sinks (*chubachas*). The proposals should be submitted to this office for opinion. Attention should be paid to the latrines, and the dry-earth system enforced: the sweepers being duly provided with the necessary implements, *viz.*, baskets and hand shovels.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

The Municipal Committee of Sádhaura have been requested to carry out the instructions of the Sanitary Commissioner, regarding latrines. With regard to the comprehensive system of sewerage recommended by the Sanitary Commissioner, the funds of the Municipality do not allow of such work being taken in hand at present. Deputy Commissioner will consult the Committee further on the subject and see, what can be done when he visits Sádhaura.

It is believed that the wells are provided with parapets, and from the high and sloping situation of the town, the water runs freely off into the street drains, but this matter also will be seen to when Deputy Commissioner visits the place.

HOSHIARPUR DISTRICT.

URMUR, AYAHPUR AND TANDA TOWNS—*Inspected on the 1st February 1882.*

These three small towns are situated within half a mile of each other. Urmur is the largest and principal town; Ayahpur is situated to the west, and Tanda to the south of Urmur, and intersected by "Chos." The soil is a mixture of sand and a very dark kind of clay, and very fertile. Sugarcane and rice are very extensively sown in these parts.

The main streets are paved with brick, and shallow drains in the centre to carry off the water, and in several places the drains are broken and causes accumulation of water, &c., which is very objectionable. The necessary repairs cannot be effected just now owing to the want of funds.

Water-supply. From wells, the water which is good and fit for consumption.

Latrines. There are 6 female latrines:—Urmur 3, Ayahpur 2 and Tanda 1. Each latrine has a separate sweeper and are in a fair, clean order.

Slaughter-houses. There are 4 slaughter-houses, 2 in Urmur and 2 in Tanda, which are kept fairly clean.

Cremation and burial grounds. Three recognized places for cremation about quarter of a mile from the town.

Remarks by Sanitary Commissioner. Repairs to old and broken drains; and all new drains should be on the "saucer-shape" pattern, and not the square or angular pattern.

LAHORE DISTRICT.

KASUR TOWN—*Inspected on 20th February 1882.*

Kasur is an old town situated to the south of Lahore at about 34 miles, and 16 miles north-west of Ferozepore. It is divided into 9 parts or *kotes*: of these the largest, known by the name of Kasur, is a walled town with 8 gates and surrounded by the other eight, which are simply small isolated collections of houses, most of which are in ruins and unoccupied, the longest distance between any of these being less than half a mile. The relative positions of these small *kotes* to the big central town are as follows:—To the south-west Murad Khan-ka-kote, to the south Dingarh Katal Garhi, Mowan Kallid and Pucca Killa, to the north-west Rukn-din-ka-Killa, and to the north Azim Khan and Fattah Din-ka-Killa. The Municipal garden, the Dispensary garden and the land within the Municipal limits, are irrigated by a branch of the Bári Doáb Canal. The inhabitants are chiefly Muhammadans.

The streets of the *Barra Kote*, or the main town, are very narrow, most of them are *pucca* built and kept clean; but those of the small *kotes* are all *kucha* and not well looked after. The drains of the main town are *pucca* made and kept very clean, and no filth is allowed to collect in them. There are hardly any drains in the smaller *kotes*, except in one or two places, which seemed to be well looked after.

The drains are daily cleansed by the sweepers and then drained off by *bhistis* entertained for the purpose. The town is divided into circles and the members of the Municipal Committee are held responsible for their respective divisions, and the whole is superintended by the Tahsildar and the Extra Assistant Commissioner. The town was very clean and tidy on the day of my inspection, but most of the smaller *kotes* were not at all looked after.

Water for drinking purposes is obtained from the wells within these several *kotes* or in their immediate neighbourhood. It is good and wholesome, and the supply ample. There are 148 wells in all.

There are 7 latrines, all *pucca* built, at some distance from the town, and in different directions. I found them all clean, but the dry-earth system is not at all carried out. It has now been explained to the members of the Municipal Committee. There are 5 *pucca* built small compounds near these latrines for the purpose of receiving the night-soil of the town and latrines, which is daily removed by the contractor, for manuring the fields.

There is a small building to the south of the town and outside the town wall used as a slaughter-house for sheep and goats, but I found that the meat was dressed outside the building in the open place. The place is not large enough for the purpose. It should be enlarged and the floor plastered and made to slope from all sides towards the central drainage, as has been fully explained to the members. The slaughter-house for the kine is at a distance of about quarter of a mile from the town and towards the south.

There are two places for burning Hindu corpses, one to the north-west and the other to the north of the town, at a distance of about quarter of a mile, but the burial grounds are encircling as it were the whole town: in fact, nothing but graves are to be seen all over the place.

Cremation and burial grounds.

The large excavations around the town ought to be filled up, and if possible, arrangements made to drain off the water of the surroundings towards the big rivulet which is not very far from the town. The brick kilns ought to be removed to some distance.

Remedial measures to be adopted and other suggestions.

Recommends that a special meeting of the Municipal Committee be convened for the purpose of carrying out as far as practicable the several suggestions made by the Civil Surgeon for the sanitary improvement of this town.

Remarks by Sanitary Commissioner.

GUJRANWALA DISTRICT.

WAZIRABAD TOWN—*Inspected on the 22nd September 1882.*

These have been very much improved lately. Several of the side streets have been newly paved, whilst the main street has had the pavement (brick on edge) renewed from end to end, with saucer drains on each side.

Streets and drains.

All the drainage of the south side of the town has been planned I believe, so as to empty itself by narrow *pucca* drains into a deep masonry channel bordering the circular road, and by which all the fluid sewage is conveyed and discharged into the Palku stream. The removal, as well as disposal of all the town refuse and sweepings is given out on contract, and realizes, I was informed, about Rs. 50 per month. I think in a large town like Wazirabad a much larger income would be obtained by a proper system of storage and sale, and that the Municipal Funds so supplemented would be enabled to provide a more efficient conservancy establishment.

System of sewerage, drainage and conservancy arrangements in force.

Is obtained from 233 *pucca* wells, of this number 55 want repairs. The water taken from 7 wells from different quarters of the town was forwarded in sealed bottles to the Chemical Examiner for analysis, last year; in 4 the water was pronounced impure, and in 1 positively unwholesome. In none was it found as pure as that from the Palku stream. Copy of the result of the analysis was forwarded to the Deputy Commissioner. The well with unwholesome water was that of the encamping-ground.

Water-supply.

There are four latrines, they are all *pucca* built, and have about 20 seats in each; but being without roofs, they have no shelter from the heat of the sun or rain. One male and one female sweeper are supposed to be attached to each. The filth is stacked a little way about 15 or 20 yards behind each latrine, from whence it is removed, once a day, by the town contractor. The seats within were much broken and the ground around deeply saturated with ordure and urine; in fact, the soil looked as if it had not been disturbed for months, and the stench was in consequence quite over-powering. I would suggest that the seats be repaired and the soil to the depth of one foot be renewed around the seats, and that if *gumlas* half filled with dry earth could be supplied, the sickening stench, as well as much discomfort, would be removed.

Latrines.

There are two: one for sheep is about a hundred yards outside the circular road on the south-west side of the town. The other for beef is at a greater distance, probably, about 300 yards to the east. Both appeared tolerably clean on the day of my inspection.

Slaughter-houses.

The cremation ground is one recently chosen, and is about a mile down on the left bank of the Palku stream. The Muhammadan burial ground just now in use is about 4 or 5 hundred yards off, eastward. There are no sanitary objections as far as I know to the position of either.

Cremation and burial grounds.

The very large number of houses, which are deserted and in ruins in this town is a matter which, I think, should engage the early and serious attention of the Municipality. It was pointed out, whilst I was inspecting, that many of these houses had remained closed and crumbling for years. The roofs of no small number had fallen in, but of a still larger proportion, nothing remained, but the bare walls. All those in the last condition were converted, I found, simply into privies, and could scarcely be entered from the sickening stench within. The effluvia from the rotting fungus-grown timber of the roofs which had fallen in were scarcely less obnoxious. The extent to which these exhalations must continue to vitiate the atmosphere of the locality and into which, but little outside fresh air can penetrate, will easily be imagined. I would suggest, that measures should be taken to induce the owners (such as can be found) to re-build, repair, or level all houses in ruin, and for such as owners cannot be found, sanction should be obtained to their being either levelled or auctioned off as building sites.

Miscellaneous.

The system of drainage requires completion and should be carried out in a comprehensive and properly surveyed plan: at present probably not more than one-third of the town is provided with new drains; but there must be a mutual obstruction between the old and new works until the latter are completed.

Remedial measures to be adopted and other suggestions.

Remarks by Sanitary Commissioner. Recommends that the Municipal Committee be invited to hold a special meeting with the view to giving practical effect to the recommendations of the Civil Surgeon. A much larger sum than Rs. 50 per mensem would be realized if some effort were made to enforce the system of extra-mural stores for town sweepings, &c., and its systematic sale by the Municipal Committee. The wells should be all periodically cleaned out and provided with parapets, and waste-water conduits emptying into the nearest street gutter. The Civil Surgeon's remarks regarding the state of the public latrines are very unsatisfactory, and the early attention of the Municipal Committee is earnestly invited to the great want of these public conveniences with glazed vessels and light roofs.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

At a meeting of the Municipal Committee held at Wazirabad, on the 9th January 1883, certain resolutions were passed with a view to carry out the suggestions of the Civil Surgeons as far as practicable.

RAWALPINDI DISTRICT.

RAWALPINDI TOWN—*Inspected from 18th to 20th June 1882.*

Preliminary remarks. The town is open, situated on the north of the left bank of Lehi rivulet, which separates it from the Military Cantonment. The site of the town is relatively low and its ventilation is not so free as that of the cantonment, and ventilation is also interfered with by the trees round about the town. The site, though relatively low as regards its surroundings, is high enough for its free and easy drainage. The Lehi river is perennial in its stream and is clean above, but becomes turbid below, the town; its water is chiefly used for bathing and washing purposes. There are two small shallow springs near the bank on the western side of the town, the water of which is used for drinking.

General description and present state of streets and drains. The town has no wall round it. The bazárs are wide and airy, and are not over-built. The lanes and streets are mostly paved with *pucca* bricks, but a few lanes of the thinly populated portion of the town are flagged with rough stones. The pavement of the lanes slopes towards the centre for drainage, but the chief bazar has side drains running along the slopes. These drains are made of bricks and open into a large gutter. This gutter is covered in part and has latticed doors, and empties into the Lehi near the Municipal garden. This drain carries only a portion of the sewage, for the rest there is no regular system of drainage. Streets were being swept and appeared fairly clean with the exception of four or eight lanes chiefly near Shah Charagh's tomb; the side gutters smelt of collected urine and filth; the other lanes were found dirty.

System of sewerage, drainage and conservancy arrangements in force. The streets and bazárs are swept morning and evening. The gutter drains and out-fall drain are flushed and cleaned twice every day. The bazárs and public thoroughfares are carefully attended to by the conservancy establishment. Filth obtained from sweepings and scavenging of streets, thoroughfares, houses and bazárs are collected in heaps in 16 or 17 fixed places, in different quarters of the town. These heaps are open, but in one place a wooden box is placed as a receptacle. The heaps are removed on donkeys morning and evening and deposited near private and municipal brick kilns. Manure stores are four in number, and are situated near public latrines at a fair distance from the city. These are large square enclosed yards, where manure is spread, stored and covered with layers of dry earth. There was no bad smell about them, and appeared well kept and in order.

Water-supply. The water-supply of the town is partly from wells and partly from Lehi river. Lehi is unusually poor in water, and most of its water is utilized in Railway workshops drawn from a point above where it is contaminated. The number of the wells is not to the proportion of the wants of the town, and before we had rain most of them almost dried up and those used to have their supply exhausted before 8 or 9 in the morning. The water obtained from wells is muddy and dirty by nature; the quality of the water is considered tolerably good; about one-fourth of the wells contain saltish or bitter water; only a few of the wells have been cleaned out in May and June. There are one *pucca* and four *kucha*, tanks, all outside the city, and contain water only in the rainy and winter season. They are used for bathing, washing and such like purposes.

Latrines. There are 26 in number, 15 are of *pucca* masonry, 6 of which are for females. The rest are *kucha* and include mat screens and wood latrines, which are large open boxes on large wheels; have no proper seats, but slits in flooring. Two latrines are roofed blocks of single rows with no *pucca* floors. Each latrine has a number of sweepers to attend to it. The faeces are received in unglazed earthen pots, which are emptied into iron jars and these jars are taken to the manure stores on carts every day. Dry earth and MacDougal's powder, are used. Latrines Nos. 3, 4, 5 are newly built and have good comfortable high seats; others are in bad repairs. There are private latrines, also, situated generally on the upper stories or open roofs of houses. They are cleaned by sweepers once a day. The sweepings and night-soil are placed in iron vessels kept outside the town until removed. The income derived from the sale of manure during the past year was Rs. 5,000.

There are 2 newly-built *pucca* slaughter-houses on the south-west side of the city, and are used by Muhammadans and Sikhs separately. That for Muhammadans has two distinct sheds, one for killing and the other for cleaning and dressing the slaughtered animals. Each has a central drain which runs into small *pucca* sinks outside the walls. These sinks are emptied every day and the blood, offal, &c., buried in pits; the floor of these houses is swept and flushed after the work is over. Slaughter-house of the Sikhs is small and has no *pucca* floor. The ground remains soiled with blood and filth. At the time of inspection the Muhammadan slaughter-house was swept and clean, but the other was dirty and neglected.

There is but one cremation ground, which has no enclosure, and is situated at a distance from the city near the Lehi. The ground is uneven and sloping, and in the rains is washed into the Lehi. The ground appeared well kept. Burial grounds are 3 in number and situated at three sides of the city. None of them have any enclosure or wall; one is located on the right hand of Lehi. The sites are fairly clean.

A good water-supply for Pindi is essentially necessary. Many of the iron receptacles for night-soil earth should be replaced. Many of the latrines are out of repair and require mending. The flooring of the main gutter is out of repair, and the sewage percolates under the floors of the houses. This is a serious sanitary defect, and the gutter should be made water tight so as to prevent this leakage. A Sub-Committee should be appointed to look after sanitation and bring defects to notice and make arrangements for their being rectified.

Supports the recommendation of the Assistant Surgeon that a Sub-Committee be appointed to look after the sanitation of the town, in order that all defects may be brought speedily to notice and rectified as far as practicable.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

Resolved that the Commissioner and Superintendent of the Division be informed that there is already a Sub-Committee appointed for the purpose of looking after the sanitation of the city, that iron receptacles for night-soil have been replaced, and that steps will soon be taken to repair the latrines, and that provision has been made in the next year's budget for the repairs of the main gutter.

JALALPUR TOWN—*Inspected on the 10th January 1882.*

Jalalpur is situate eight miles east of the Sadr station. There is a Dispensary in the town. The northern side of the town is raised above the level of the country which favors efficient drainage into the Duara stream, distant about half a mile.

There is one main bazár street running through from west to east, which is paved and has side drains. Three lanes which pass through the town are also paved and drained by shallow side drains, besides several narrow tortuous unpaved blind alleys. The pavement of the bazár has been repaired and the drains are in good order. The outfall drain on the north-east side need not to be extended, to carry off storm water effectively. There are three extensive irregular excavations, two on the west side and one on the south side of town, which hold foul stagnant water. There is a proposal to dispose of the smaller excavations to be filled up and cultivated, also a scheme to connect these cesspools by channels for final conduction of storm water to the Duara stream.

The people generally go afield, or visit the extra-mural latrines. Private sweepers in mohallas convey the dry sewage from house tops and house latrines to be trenched near latrines. Six urinals consisting of large earthen vessels in masonry wells, enclosed by plank screens, are in use and are daily cleaned out.

From wells. There are 88 in and about the town. All cylinders are unplastered. Sixty-four have platforms and twenty reservoirs. Three are in ruins. Average depth of spring level 27 feet. The water is clear and sweet, and does not become turbid, being drawn by hand and in constant demand. Three wells have been cleaned since last inspection. Estimates are prepared for extension of conduits and platforms, and for repair of wells.

There are 26 sweepers employed on Rs. 3 each per mensem, supervised by two Mussalman jama-dars on Rs. 7 and Rs. 5 per mensem. The establishment sweeps the streets and drains clear. The sweepings are then carried away from certain appointed places by a contractor.

There are six extra-mural latrines. Each divided for the accommodation of the sexes. These enclosures are built of masonry, having seats along the walls, with opening in the walls, behind each seat for the removal of earthen pans. Dry earth is stored and used. The sewage is trenched and buried near latrines. Two latrines were repaired since last inspection.

Two places are appointed for the slaughter of animals; both are unenclosed, but sanction has been obtained to wall in these places which are about 200 yards distant from the town walls. These areas are now trenched for the burial of blood and droppings.

There are four cremation places, distant four hundred yards or more. One is near a *kucha* tank which does not receive town drainage. This cremation ground is to be walled in, and the tank reserved for mourners and relations to bathe in. Cremation and burial grounds. There are two burial grounds more than half a mile away. One a cemetery near the town, is disused.

Remarks by Sanitary Commissioner. Recommends that a special meeting of the Municipal Committee be convened to consider over and report upon the several suggestions made in this report by the Civil Surgeon for the sanitary improvement of this town and that whatever steps be decided upon this office be informed of the same in due course.

ACTION TAKEN ON THE SUGGESTIONS MADE IN THE ABOVE REPORT.

Resolved that the suggestions made by the Civil Surgeon for the sanitary improvement of the town be kept in view. The outfall drain on north-east side, which the Civil Surgeon recommends to be extended, will be at once taken in hand; and as to the three excavations, two on west side and one on south side of the town, which hold foul water, the question has been referred to the Sub-Committee for report and suggestions in order to remove the defect.

CHINIOT TOWN—Inspected on the 26th February 1882.

Preliminary remarks. The day of my visit was not quite unexpected. I made a regular inspection on the 26th of February, and on the 2nd and 3rd of March 1882. I paid two more visits to the town in company with the Deputy Commissioner, who very kindly held a special meeting of the Municipal Committee to consider the necessary sanitary improvements that were urgently required.

Streets and drains. No change in form, construction and pavement. Surface cleanliness has greatly improved of late but still some of the streets and blind alleys are disgusting *ad nauseum*. Offensive stench—which are, perhaps, not perceived by the residents habituated to them—assail a stranger from all sides. Drains same as before. The three principal streets which are paved are also provided with drains but the latter have no good slope and remain dirty. A very great part of the town is not provided with pavement or gutters.

System of sewerage, drainage and conservancy arrangements in force. No change yet. At a meeting of the Municipal Committee presided by the Deputy Commissioner and held on the 3rd of March, some reduction in the amount of ordinary current expenditure of the Committee has been effected by which it is hoped more money will be available for sanitary improvements. It has been decided by the Committee to build four sets of latrines at suitable distances outside the town. It being discovered that the Municipal Committee had no bye-laws to enforce certain necessary regulations regarding conservancy, the Committee agreed to adopt the bye-laws of the Lahore Municipality and to apply to Government for sanction.

The conservancy establishment has not been increased but orders have been given by Mr. Macauliffe, the Deputy Commissioner that the Tahsildar and the Municipal Committee shall be responsible for thorough cleaning of the town, and that they shall report monthly on the working of the establishment and state of conservancy.

Thus a fair start has been made in the right direction, I hope also that the number of sweepers and their pay will be increased as soon as funds be available for the purpose. Any money spent on the increase of a strictly well looked after sweeping establishment will repay itself by the increased amount of manure collected. The sale of manure in a proper way requires the Committee's great attention.

Water-supply. Nearly half of the 85 wells supplying drinking water have been improved by the owners by constructing parapets and providing roofs. The principles of protection, however, have not been thoroughly understood. In many places the platforms and the water-vessel stands slope in the wrong direction. The platforms and copings should slope away from the mouth of the wells. This has been explained to the owners of the wells, as well as to the members of the Municipal Committee and Tahsildar. The insanitary condition of the Tahsíl well and of that belonging to a rich member of the Municipal Committee has been much improved.

Latrines. Four sets of latrines have been sanctioned by the Committee, and will, it is hoped, be soon built.

Slaughter-houses. No objection to the place for slaughtering kine. A goat slaughter-yard should be provided.

Remarks by Sanitary Commissioner. Recommends that a special meeting of the Municipal Committee be convened for the purpose of carrying out as far as practicable, the several suggestions made by the Civil Surgeon for the sanitary improvement of this town.

61. The general result of the year's experience in regard to the sanitary inspection by vaccinators, shows that much good has been effected, though, taking the Province, as a whole, it is yet hardly appreciable. I have reason to believe that the visit of the vaccinators as Sanitary Inspectors, not-
Result of year's experience in regard to sanitary inspection satisfactory.

withstanding a few exceptional cases, is far from being generally objected to by the people at large. I have taken the opportunity myself during my tours to let it be known that these officials are charged with no authority whatever to interfere with the villagers, their sole duty being to inspect and report to superior authority. As far as I can judge, the people generally are pleased to know that so much care and interest is taken in their welfare by the Government, and I have on repeated occasions heard expressions of appreciation of the service, and I am hopeful that as the people become more accustomed to the work of sanitary inspection by these men, their natural prejudices and fears, the result of ignorance, will rapidly disappear, and that they will themselves, as time goes on, take an active interest in the work of their village sanitation.

62. Proposals for the extension of the Hygiene Class connected with the Medical Schools, Lahore, for the education of vaccinators in the elementary principles of Sanitary Science, has also been made, and is now under the consideration of the Medical Faculty.

Hygiene Class for education of vaccinators in Sanitary Science.

63. In para. 110 of my previous Report I appended a list shewing the names of official and non-official Native gentlemen who were recommended by the District authorities for the interest evinced by them in the cause of vaccination and sanitary reform. For the more effectual administration of this Department I would here respectfully state that I incline to the opinion that it is a great desideratum to recognise in some tangible way the services of every individual thus recommended either by a presentation of a "Khilat," or "Parwana," which should be forwarded by the Punjab Government through this Department, for transmission to the recipients; and I therefore again beg to append the names of the following Native gentlemen in the accompanying list to the favorable notice of Government:

Names of Native Officials and Non-officials in each district of the Province whose services in the cause of vaccination and sanitation are brought to the notice of Government.

Distriet.	Name.	Occupation.	Place of residence.		
Delhi	Mir Iftikhar Ali	Honorary Magistrate	Sonepat.		
	Karim-ud-din				
	Muhammad Zaqi				
	Nawab Zaman Ali				
Gurgaon	Mian Omrao Khan	Member, Municipal Committee	Sohna.		
	Babu Jugal Kishor	Tahsildar	Palwal.		
	Lalla Radha Kishen	Zaildar			
	Mian Sharafat Ali	City Inspector	Hodal, Tahsil, Palwal.		
	Bhai Nathu Singh	Zaildar			
	Mian Kale Khan	City Inspector			
Karnal	Lalla Raja Lal	Extra Assistant Commissioner	Kaitlhal.		
	Pandit Sri Kishen	Tahsildar	Do.		
Sirsa	Mian Nur Muhammad Khan	Nawab's Agent	Kunjpora.		
Umballa	Lalla Hukm Chand	Member, Municipal Committee	Ellenabad.		
	Lalla Sukhdco Singh	Head Master	Jagadhri.		
Hoshiarpur	Sheikh Mir Ali	Members, Municipal Committee	Hoshiarpur.		
	Chaudhri Brainma Mal				
	Lalla Ram Rattan				
	Lalla Ganda Mal				
	Lalla Hira Nand				
	Lalla Kanhya Lal				
	Lalla Hami Chand				
	Mian Sandeh Khan				
	Mian Ghulam Husain Khan				
	Lalla Brahma Mal				
	Mian Hafiz Habibulla			Do. do.	Kasur.
	Mian Chirag Shah				
Mian Hyat Khan	Tahsildar	Patti.			
Mian Hafiz Abdulla					
Lalla Jaga Nath	Members, Municipal Committee	Ramnagar.			
Mirza Khalil Beg					
Mirza Mubarik Ali Beg	Tahsildar	Wazirabad.			
Mian Muhammad Ashraf Khan					
Gujranwala	Lalla Har Narian	Member, Municipal Committee	Ferozepore.		
	Sardar Jawala Singh	Members, do.			
	Qazi Niaz Ali		Tahsildar	Dingah.	
	Lalla Ralla Ram				
Ferozepore	Lalla Pars Ram	Honorary Magistrate	Girott.		
	Mir Muhammad Ali Khan	Member, Municipal Committee			
Gujrat	Mian Muhammad Khan	Members, Municipal Committee	Pirkot Sarhana.		
Shahpur	Mian Jiwan Singh			Do. do.	
	Lalla Ram Kaur	Zaildar	Shorkot.		
Jhang	Lalla Namdar Phuli	Tahsildar		Ahmadpur.	
	Raja Aurangzeb	Naib-Tahsildar			
		Mian Imam Shah	Member, Municipal Committee		
	Lalla Sukhu Ram				

64. —In conclusion I beg to bring to the favorable notice of Government, the services of Mr. W. DeRozario, the Superintendent of my office, who has always discharged his duties in a very intelligent and creditable manner, as also of Lalla Kashi Ram and Mr. A. Lincoln, the 2nd and 3rd clerks. I would here particularly mention the very valuable assistance they rendered me in the compilation of the numerous statistical tables attached to my "History of Cholera in India from 1862 to 1881," which was a work of very considerable labor and trouble. The Sherishtedar or Head Vernacular Muharrir, Lalla Sundar Das has, also, given me great satisfaction in the discharge of his duties.

H. W. BELLEW,
DEPUTY SURGEON-GENERAL,
Sanitary Commissioner, Punjab.

APPENDIX A.

LAWRENCE MILITARY ASYLUM AT SANAWAR.

A.— Table showing the *SICKNESS* and *MORTALITY* among the *CHILDREN* of the above *ASYLUM* during the year 1882.

MONTHS.	Average strength.		Average No. daily sick.		No. daily sick per cent. of strength.		No. of deaths		Died per 1,000 of strength.		CAUSES OF DEATHS IN HOSPITAL.			
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Enteric fevers.		All other causes.	
											Boys.	Girls.	Boys.	Girls.
January	243	182	7.54	8.12	3.10	4.46	...	...	...	...	...	...	...	...
February	241	182	13.07	10.00	5.42	5.49	...	...	...	...	...	...	...	...
March	239	180	11.41	9.83	4.77	5.46	...	...	...	...	...	...	...	...
April	238	185	14.13	10.50	5.93	5.67	...	...	...	...	...	...	...	...
May	239	185	15.12	10.80	6.32	5.83	...	...	...	...	...	...	...	...
June	238	186	11.26	10.76	4.73	5.78	...	...	...	...	...	...	...	...
July	239	182	11.41	11.58	4.77	6.36	...	...	...	...	...	...	...	...
August	242	182	12.03	16.09	4.97	8.84	...	...	...	...	...	...	...	...
September	244	182	13.63	14.03	5.58	7.70	...	...	...	...	...	...	...	...
October	248	180	15.58	7.45	6.28	4.13	...	...	...	...	...	...	...	...
November	242	183	18.30	13.36	7.56	7.30	...	...	...	...	...	...	...	...
December	240	183	17.03	9.12	7.09	4.98	1	1	4.16	5.46	1	...	...	1
											1	...	...	1
											Died per 1,000 of the average strength.			
For the year	241.08	182.66	13.37	10.97	5.54	6.09	1	1	4.14	5.46	4.14	...	...	5.46

DISTRIBUTION of CHILDREN according to AGE on 1st July 1882.

SEX.		2 and under 5 years.	5—10	10—15.	15—20.	Total of all ages.	REMARKS.
Boys	...	1	73	132	33	239	
Girls	...	2	66	91	23	182	
Total	...	3	139	223	56	421	

B.—TABLE showing the CAUSES of ADMISSIONS into HOSPITAL among the
year

Causes of admissions.				NUMBER IN											
				January.		February.		March.		April.		May.		June.	
				Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Small-pox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chicken-pox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mcasles	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Enteric fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Simple continued fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intermittent and remittent fevers	...	...	...	...	1	1	2	...	...	...	...	...	...	...	...
Malignant cholera	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diphtheria	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hooping-cough	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mumps	...	...	...	...	1	...	...	...	1	1	1	...	...	...	...
Acute rheumatism	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...
Phthisis pulmonalis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meningitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sun-stroke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Epilepsy	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Conjunctivis (ophthalmia)	...	...	...	2	2	...	...	1	...	2	...	1	...	1	...
Valve disease of heart	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Croup	...	...	...	2	1	...	1	...	...	...	...	...	...	...	1
Bronchitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pneumonia	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Dysentery	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Diarrhoea	...	...	...	...	...	4	1	...	...	...	...	...	5	...	3
Ulcer	...	...	...	2	2	1	...	1	1	...	...	2	...	...	...
Tinea favosa	...	...	...	1	1	2	...	1	3	3	...	2	1	1	1
Itch	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wounds and accidents	...	...	...	...	...	...	...	...	...	3	...	3	...	1	...
All other causes	...	...	...	8	10	16	15	24	11	24	8	23	15	20	15
TOTAL	...	...	...	15	19	24	19	28	16	35	9	33	21	24	20

Admitted per cent. of the average

6 17	10 43	9 95	10 43	11 71	8 88	14 70	4 86	13 80	11 35	10 08	10 75
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CHILDREN of the LAWRENCE MILITARY ASYLUM, SANAWAR during the 1882.

EACH MONTH.												Total admis- sions during the year.		Admitted per cent. of strength.		Died per cent. of admissions.	
July.		August.		September.		October.		November.		December.							
Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
..
..
..
..	1	..	..	1	..	..	..	1	1	0·41	0·54	100·0	..
..	2	..	1	..	1	..	4	..	1·65	..	..	..
..	..	5	..	..	1	..	..	..	..	1	..	7	4	2·90	2 18	..	..
..
..
..
..	1	1	4	0·41	2·18	..	..
1	..	1	..	..	..	..	..	..	..	..	..	5	..	2·07	..	..	..
..
..
..
..	1	..	0·54	..	..
..	7	2	2·90	1·09	..	..
..
..	1	..	..	..	..	..	..	2	4	0·82	2·18	..	..
..	..	2	..	..	..	..	..	..	..	..	..	2	..	0·82	..	..	..
..	2	..	0·82	..	..	..
1	2	..	..	..	..	..	4	..	1·65	..	..	..
1	7	2	14	2	1	..	2	1	1	..	3	10	37	4·14	20·21	..	..
..	1	..	..	..	..	1	1	1	1	..	..	8	6	3·31	3·27	..	..
1	2	2	1	2	..	5	..	6	7	4	2	30	18	12·44	9·83	..	..
..
2	..	1	..	1	..	..	..	1	..	..	..	12	..	4·97	..	..	..
14	11	9	9	13	5	14	6	9	13	15	26	189	144	78·42	78·68	..	100·0
20	21	22	24	18	9	24	9	20	22	21	32	284	221				

strength in each month.

8·36	11·53	9·09	13·18	7·37	4·94	9·67	5·00	8·26	12·02	8·75	17·48	117·84	120·76
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LAWRENCE MEMORIAL ASYLUM AT MURREE.

A.—Table showing the *SICKNESS and MORTALITY* among the *CHILDREN* of the above *ASYLUM* during the year 1882.

MONTHS.		Average strength.		Average number daily sick.		Number daily sick per cent. of strength.		Number of deaths.	
		Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
January	...	87	69	0.42	1.06	0.48	1.53	...	...
February	...	89	69	0.18	0.57	0.20	0.82	...	...
March	...	89	69	1.64	1.68	1.84	2.43	...	...
April	...	90	69	1.35	1.53	1.50	2.21	...	...
May	...	90	69	1.09	1.48	1.21	2.14	...	...
June	...	90	68	1.73	1.29	1.92	1.90	...	...
July	...	93	67	0.03	0.00	0.03	0.00	...	...
August	...	93	67	0.51	0.45	0.54	0.67	...	...
September	...	92	67	1.60	0.20	1.74	0.30	...	...
October	...	91	69	0.77	0.00	0.84	0.00	...	...
November	...	87	64	0.00	0.33	0.00	0.51	...	...
December	...	91	66	0.26	0.00	0.22	0.00	...	...
For the year	...	90	68	0.80	0.71	0.88	1.04	...	...

DISTRIBUTION of CHILDREN according to AGE on 1st July 1882.

Sex:	2 and under 5 years.	5—10.	10—15.	15—20.	Total of all ages.	REMARKS.
Boys	...	18	62	10	90	
Girls	...	18	37	13	68	
Total	...	36	99	23	158	

B.—TABLE showing the CAUSES of ADMISSIONS into HOSPITAL among the year

				NUMBER IN											
				January.		February.		March.		April.		May.		June.	
Causes of Admissions.				Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Small-pox	...	...	...	..	..	..	..	..	..	..	..	..	..	..	..
Chicken-pox	...	...	...	...	...	...	..	...	...	...	...	...	...	...	..
Measles	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Enteric fever	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Simple continued fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intermittent and remittent fever	...	...	...	...	1	1	...	...	...	...	1	...	1	2	1
Malignant cholera	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diphtheria	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hooping-cough	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mumps	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Acute rheumatism	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Phthisis pulmonalis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meningitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sun-stroke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Epilepsy	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
Conjunctivis (ophthalmia)	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
Valve disease of heart	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Croup	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchitis	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...
Pneumonia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dysentery	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Diarrhoea	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Ulcer	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Tinea favosa	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Itch	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wounds and accidents	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
All other causes	...	...	...	2	1	1	3	4	3	3	3	4	4	8	4
TOTAL	...	...	...	2	3	2	3	7	6	5	4	5	6	11	6

Admitted per cent. of the average

2.29	4.35	2.24	4.35	7.86	8.69	5.55	5.79	5.55	8.69	12.22	8.82
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CHILDREN of the LAWRENCE MEMORIAL ASYLUM, at MURREE, during the 1882.

EACH MONTH.												Total admis- sions during the year.	Admitted per cent. of strength.	Died per cent. of admissions.			
July.		August.		September.		October.		November.		December.							
Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
..
..
..
..	2	..	..	..	2	..	2.94	..	..
..	1	..	..	..	..	..	4	4	4.44	5.88	..	..
..
..
..
..	1	..	1.11	..	..	..
..
..
..
..	1	..	..	..	..	..	..	..	..	..	3	..	4.41	..	..
..	1	..	1	2	1.11	2.94	..	..
..
..
..	3	..	3.33	..	..	..
..
..	1	..	..	..	..	..	..	..	2	..	2.22	..	..	..
..	1	..	1.11	..	..	..
..	1	..	..	..	..	..	..	..	1	..	3	..	4.41	..	..
..	1	..	1.47	..	..
..
..	1	..	1.11	..	..	..
1	..	2	2	4	2	2	..	..	..	..	..	31	22	34.44	32.35	..	..
1	..	2	4	5	2	3	..	..	2	1	1	44	37				

strength in each month.

1.07	0.00	2.15	5.97	5.43	2.98	3.29	0.00	0.00	3.12	1.09	1.51	48.88	54.41
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APPENDIX B.

POLICE FORCE.

No. I.—TABLE showing the SICKNESS and MORTALITY among the POLICE FORCE serving in the PUNJAB during the year 1882, and the prevalence of the principal diseases in each month of the year.

MONTHS.	CAUSES OF DEATHS IN HOSPITAL.										Died per 1,000 of strength.	Number of deaths.	Number daily sick per cent. of strength.	Average number daily sick.	Average strength.	
	Small-pox.	Enteric fever.	Simple continued fever.	Intermittent and remittent fever.	Malignant cholera.	Phthisis pulmonalis.	Scurvy.	Apoplexy.	Heart disease.	Respiratory diseases.						Dysentery.	Diarrhoea.	Hepatitis.	Wounds and accidents.	All other causes.	Died out of Hospital.
January	1	1	...	...	...	9	...	...	...	...	1	11
February	1	...	3	...	...	...	9	...	...	...	...	4	9
March	1	...	...	...	6	...	...	...	...	2	7
April	1	...	...	...	...	1	7	...	1	...	...	2	9
May	1	...	1	...	...	...	4	...	...	...	...	1	4
June	...	1	...	...	...	1	...	1	...	2	...	...	...	...	3	7
July	1	1	...	...	...	5	...	...	...	...	...	2
August	1	...	...	...	...	...	1	...	...	...	...	...	3
September	2	...	...	...	...	...	...	1	...	...	1	2	7
October	...	1	...	3	...	...	...	...	...	6	7	...	...	...	2	10
November	1	...	...	...	1	...	10	2	...	...	1	1	9
December	1	...	...	...	...	...	...	17	2	...	1	...	3	19
	...	2	2	10	2	8	...	2	1	76	12	1	1	3	22	100
Died per 1,000 of the average strength.																
For the year 1882...	0.71	0.10	0.41	...	0.10	0.05	3.87	0.61	0.05	0.05	0.15	1.12	5.09
For the year 1881...	1.69	1.74	0.51	...	0.10	0.05	2.61	0.26	0.51	...	0.10	1.07	7.58

CAUSES OF ADMISSION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												Total admissions during the year.	Admitted per cent. of strength.	Died per cent. of admissions.	
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.				
Small-pox	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Enteric fever	...	...	...	...	1	...	...	...	...	1	...	...	2	...	...	...
Simple continued fever	...	...	...	1	5	5	1	2	5	9	5	4	39	...	...	...
Intermittent and remittent fever	154	121	174	157	295	247	203	611	761	826	633	311	4,493	22.87	0.31	...
Malignant cholera	1	...	...	...	...	...	1	...	...	...	...	...	2	0.01	100	...
Rheumatism	30	32	16	22	27	23	19	50	18	23	22	34	286	1.45	...	...
Primary Syphilis—																
Hard chancre (indurated bubo)	2	...	3	2	3	4	9	8	10	8	7	3	59	0.30	...	...
Soft chancre (suppurating bubo)	5	11	7	5	8	7	8	10	9	8	8	8	94	0.48	...	...
Secondary syphilis	...	3	5	6	6	3	1	5	6	4	3	8	58	0.29	...	...
Phthisis pulmonalis	5	4	8	3	3	5	3	...	2	1	2	2	38	0.19	21.05	...
Scurvy...	1	...	...	...	1	1	2	...	...	...	1	3	9	0.04	...	...
Apoplexy	...	...	...	...	...	1	1	...	...	...	1	...	3	0.01	66.67	...
Eye diseases	10	14	16	26	43	21	20	34	20	14	9	...	236	1.20	...	...
Respiratory diseases	101	75	78	52	35	21	30	17	17	41	70	102	639	3.25	11.89	...
Dysentery	5	4	9	21	24	23	17	36	49	80	53	28	349	1.78	3.44	...
Diarrhoea	6	9	6	6	9	5	5	15	17	14	10	9	111	0.56	0.90	...
Tænia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hepatitis	3	...	1	...	1	...	2	2	4	2	...	4	19	0.10	5.26	...
Gonorrhœa	10	3	8	9	15	17	13	10	11	10	9	12	127	0.65	...	...
Guinea-worm	...	...	...	...	1	2	7	4	6	4	1	...	25	0.13	...	...
Abscess and ulcer	60	54	71	62	69	70	88	109	67	48	53	43	794	4.04	...	...
Wounds and accidents	13	11	18	19	8	12	19	11	8	8	10	7	144	0.73	2.08	...
All other causes...	109	75	119	104	103	94	85	98	67	90	95	100	1,139	5.80	1.93	...
	525	417	539	495	657	561	534	992	1,077	1,191	992	687	8,667	44.12		
Admitted per cent. of the average strength in each month.																
For the year 1882		2.67	2.12	2.74	2.52	3.34	2.85	2.72	5.05	5.48	6.06	5.05	3.50	44.12		
For the year 1881		2.52	1.72	2.01	2.32	2.55	2.38	2.39	4.56	7.93	7.15	4.74	2.75	43.05		

No. II.—TABLE showing the SICKNESS and MORTALITY among the Police Force

Number.	DISTRICTS.	Average strength.	Number of admissions.	Admissions per cent. of strength.	Average number of daily sick.	Number daily sick per cent. of strength.	Number of deaths.	Died per 1,000 of strength.
1	Delhi ...	1,171	637	54·40	20·80	1·78	11	9·39
2	Gurgaon ...	527	242	45·92	9·94	1·88	6	11·38
3	Karnál ...	607	189	31·14	10·85	1·78	14	23·06
4	Hissar ...	532	225	42·29	9·64	1·81	9	16·92
5	Rohtak ...	449	153	34·07	5·36	1·19	3	6·68
6	Sirsa ...	366	138	37·70	4·54	1·24	4	10·93
7	Umballa ...	1,152	291	25·26	9·42	8·18	13	11·28
8	Ludhiána ...	548	232	42·33	6·42	1·17	3	5·47
9	Simla ...	216	89	41·20	3·03	1·40	3	13·89
10	Jullundur ...	523	159	30·11	9·12	1·72	1	1·89
11	Hoshiárpur ...	491	146	29·73	8·22	1·67	6	12·22
12	Kángra ...	411	183	44·52	6·41	1·55	9	21·90
13	Amritsar ...	932	663	71·14	18·97	2·03	14	15·02
14	Gurdáspur ...	594	166	27·95	6·49	1·09	11	18·52
15	Siálkot ...	544	69	12·68	4·30	0·79	4	7·35
16	Lahore ...	1,363	730	53·56	41·52	3·05	28	20·54
17	Gujránwála ...	479	128	26·72	9·14	1·91	2	4·17
18	Ferozepore ...	552	192	34·78	9·38	1·70	4	7·25
19	Rawalpindi ...	1,023	394	38·51	12·25	1·19	17	16·62
20	Jhelum ...	513	393	76·61	6·04	1·17	10	19·49
21	Gujrát ...	363	105	28·92	5·21	1·43	...	...
22	Shahpur ...	465	224	48·17	5·29	1·14	3	6·45
23	Mooltan ...	888	561	63·17	20·77	2·34	10	11·26
24	Jhang ...	471	232	49·26	8·52	1·81	2	4·25
25	Montgomery ...	488	283	57·99	6·75	1·38	...	...
26	Muzaffargarh ...	393	408	103·82	15·21	3·87	3	7·63
27	Dera Ismail Khan ...	583	139	23·84	5·45	0·93	13	22·30
28	Dera Gházi Khan ...	487	241	49·49	7·47	1·53	7	14·37
29	Bannu ...	460	171	37·17	4·12	0·89	2	4·35
30	Pesháwar ...	1,082	476	43·99	14·07	1·30	16	14·80
31	Hazára ...	489	176	36·00	7·92	1·62	7	14·31
32	Kohát ...	478	232	48·53	9·21	1·93	7	14·64
TOTAL ...		19,645	8,667	44·12	321·83	1·64	242	12·32

serving in each District of the Punjab during the year 1882.

CAUSE OF DEATHS IN HOSPITAL.

Small-pox.	Enteric fever.	Simple continued fever.	Intermittent and remittent fever.	Malignant cholera.	Phthisis pulmonalis.	Scurvy.	Apoplexy.	Heart diseases.	Respiratory diseases.	Dysentery.	Diarrhoea.	Hepatitis.	Wounds and accidents.	All other causes.	Died out of Hospital.	Number.
..	1	1	..	..	..	7	1	..	..	..	1	..	1
..	1	..	..	..	..	1	1	2	..	..	..	1	..	2
..	1	..	..	..	..	3	1	..	..	1	1	7	3
..	1	..	2	..	..	..	4	..	..	..	..	..	2	4
..	3	..	..	..	..	..	..	5
..	1	..	..	..	..	..	3	6
..	2	1	..	1	..	1	8	7
..	2	..	..	..	..	1	..	8
..	2	1	9
..	1	..	..	..	..	..	..	10
..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	4	11
..	2	..	..	..	..	..	7	12
..	2	..	2	..	..	..	9	1	..	..	..	..	..	13
..	..	1	..	..	..	..	..	..	4	..	..	..	..	1	5	14
..	2	1	..	..	..	..	1	15
..	1	..	14	1	1	..	2	1	8	16
..	2	17
..	3	..	..	..	..	1	..	18
..	1	..	..	..	..	4	12	19
..	1	..	..	..	1	..	..	..	..	..	..	3	5	20
..	21
..	1	..	..	..	..	..	2	22
..	1	..	2	..	..	..	..	..	6	1	..	..	..	..	..	23
..	1	..	..	..	..	..	..	..	..	1	..	24
..	25
..	1	..	1	..	..	..	..	1	..	..	..	..	..	26
..	4	..	..	..	..	2	7	27
..	2	1	..	..	..	..	4	28
..	1	..	..	..	..	..	1	..	..	..	..	..	..	29
..	3	1	..	..	..	1	11	30
..	1	..	..	..	..	..	..	..	..	..	6	31
..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	5	32
...	2	2	10	2	8	..	2	1	76	12	1	1	3	22	100	

APPENDIX C.

REPORT ON THE HEALTH OF VILLAGES IN THE DELHI AND KARNAL DISTRICTS SITUATE ON THE WESTERN JAMNA CANAL.

THE question whether canal irrigation does or does not exercise a deleterious effect upon the health of the population has been under discussion for many years, but owing to there being no sufficiently precise data available for determining the excess mortality occurring in irrigation, as compared with unirrigated tracts, no satisfactory conclusions have been arrived at. In 1875, Her Majesty's Secretary of State (*vide* para. 3 of his Despatch No. 81, dated 12th August 1875, to the address of the Government of India) directed that "some special effort should be made to obtain a reliable record of the results on the health of the people of the works which have recently been sanctioned for the improvement of the Western Jumna Canal, and that he would be glad to hear that some means could be devised of accomplishing this, that possibly some part of the area to be improved might be selected, and special means taken to secure a record of the statistics of disease and mortality for a sufficient period of time, to test the result of the works of improvement." Accordingly, in pursuance of orders received from the Government of India and the Local Government, as per correspondence noted in the margin, the following arrangements were made in order to give effect to the wishes of Her Majesty's Secretary of State :—

(1).—A census was taken in 1877 of certain villages in the Karnál and Delhi Districts situated in close proximity to the Western Jamna Canal. (2).—A special agency was organized for the registration of Vital Statistics in the selected areas, and the work of compilation was entrusted to this office.

The names and population of the villages censused are given below ; but I should here add, that the late Dr. Adam Taylor when officiating as Sanitary Commissioner of the Punjab, on making an inspection of these villages in the latter part of 1879, was informed that, owing to agricultural distress and scarcity, the population in 1877 had been very materially affected by emigration and immigration. This fact, it appears, was borne out by the searching enquiry made by the Extra Assistant Commissioner of Karnál. The matter was brought by this office to the notice of the Civil authorities, but so far as I am aware, no great change is supposed to have occurred. It may be well therefore to suppose that the efflux and influx were equal.

DELHI VILLAGES.

Tajpur (Tihari Khurd)	419	Jafarabád	... 476
Bathgaon	... 4,442	Khizarpur Ját	... 409
Barawasni	... 1,895	Maikhana	... 1,151
Mahra	... 1,646	Kareori	... 756
Dabarpur	... 456	Hassanyárpur (Tihari	
Hulaheri	... 894	Kalan)	... 405
Garhi Brahman	... 545	Bágru	... 703
Bádshahpur Majri	... 377	Jharauti	... 514
Jáji	... 581	Anandpur	... 287
Kakrohi	... 2,109	Bhadhanah	... 1,233
Jnan	... 3,039	Jharant	... 579
Situali	... 835	Rohát	... 2,761
Chitánah	... 835		
Kheri Darya	... 633	Total	... 27,983

KARNAL VILLAGES.

Kharkali	... 122	Ganjar	... 560
Jhiwarheri	... 347	Barauli	... 767
Hasanpur	... 397	Babarpur	... 385
Rasin	... 421	Begampur	... 249
Phorlak	... 1,384	Dolanah	... 932
Opli	... 80	Kotannah	... 67
Garaundah	... 3,629	Baholi	... 598
Malakpur	... 152	Razapur	... 123
Bádshahpur	... 51	Khacoli	... 990
Ghora Gharri	... 164	Muhammadpur	... 631
Sheikhpura	... 774		
Godah	... 1,178		
Kohand	... 1,152	Total	... 15,153

The total population of the villages thus selected, according to the Census of 1877, and their birth and death-rates are shown in the following table for the five years 1878 to 1882 :—

	Population.	1878.*		1879.		1880.		1881.		1882.	
		Birth rate.	Death rate.	Birth rate.	Death rate.	Birth rate.	Death rate.	Birth rate.	Death rate.	Birth rate.	Death rate.
Delhi Villages	... 27,983	55	120	24	65	31	47	41	58	39	46
Karnál do.	... 15,153	36	57	27	76	34	44	45	41	47	37

* Half year ending in December 1878.

For the purposes of comparison with the results shewn in previous years, I annex in tabular form, from 1878 to 1882, the statistics of deaths by diseases, by months, and by ages.

B.—Statement showing the total deaths registered from different causes during the years 1878 to 1882.

				HALF YEAR ENDING IN DECR. 1878.		1879.		1880.		1881.		1882.	
				Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.
Cholera	...	...	...	...	...	3	7	...	...	1	...	...	...
Small-pox	...	...	...	1	43	...	50	4	5	11	2	3	11
Fevers	...	...	...	1,363	318	1,481	867	1,036	511	1,192	447	946	395
Bowel-complaints	...	...	...	44	7	86	35	61	11	64	4	49	10
Injuries	...	...	...	7	3	11	2	4	3	5	3	7	6
All other causes	...	...	...	260	65	232	197	218	144	346	170	292	144
Total	...	...	...	1,675	436	1,813	1,158	1,323	674	1,619	626	1,297	566

C.—Statement showing the total deaths registered by months during the years 1878 to 1882.

				HALF YEAR ENDING IN DECR. 1878.		1879.		1880.		1881.		1882.	
				Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.
January	...	...	...	...	...	165	84	144	105	116	42	120	57
February	...	...	...	...	...	87	51	107	56	151	59	99	41
March	...	...	...	...	...	102	42	84	53	126	58	109	33
April	...	...	...	...	...	84	35	77	43	107	40	87	40
May	...	...	...	...	...	130	125	76	37	109	42	133	40
June	...	...	...	...	...	122	48	80	45	91	53	116	46
July	...	...	...	87	43	97	62	61	46	76	33	72	40
August	...	...	...	123	41	129	124	86	57	75	49	79	52
September	...	...	...	165	61	197	172	119	67	151	64	92	48
October	...	...	...	518	75	232	193	152	62	176	43	94	50
November	...	...	...	513	148	232	128	175	58	224	62	143	53
December	...	...	...	269	68	236	94	162	45	217	81	153	66

D.—Statement showing deaths registered according to ages in the Delhi and Karnal villages during the years 1878 to 1882.

				HALF YEAR ENDING IN DECR. 1878.		1879.		1880.		1881.		1882.			
				Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.	Delhi villages.	Karnal villages.		
Under 1 year	...	...		447	90	276	205	246	135	417	176	300	157		
1 year and under 6	...	...		378	112	277	293	148	79	217	84	89	75		
6 years	„	12	...	47	16	53	45	40	24	60	26	51	17		
12	„	„	20	...	...	56	11	64	41	54	30	85	29	86	26
20	„	„	30	...	...	113	25	183	66	170	60	175	61	147	51
30	„	„	40	...	...	111	29	184	98	147	77	161	71	182	62
40	„	„	50	...	...	155	40	230	115	200	87	178	58	160	68
50	„	„	60	...	...	138	29	227	113	132	87	155	56	127	44
60	„	„	and upwards	...	...	230	84	319	182	186	95	171	65	155	66
All ages	{	Males	...	...	852	247	985	613	749	356	869	338	717	304	
		Females	...	...	823	189	828	545	574	318	750	288	580	262	
Total				...	1,675	436	1,813	1,158	1,323	674	1,619	626	1,297	566	

From these it will be seen that the general results afforded by the returns of four and-a-half years in connexion with this special enquiry corroborate what I have already stated in paragraph 6 of my report for 1880, *viz*: “that it is clear that the health of the population of these villages has suffered in greater proportion than that of any other locality in the Province. Of course the special registration will have to be continued for some years yet (as I have previously stated) before any definite conclusions can be arrived at, but so far as my experience goes, I can understand how such canal streams traversing the porous soil of a level locality can exercise a certain influence prejudicial to its salubrity. For “chill” is the most common cause of the epidemic fevers (“malarious fevers” as they are popularly called) which prove so destructive to life in localities where the soil or sub-soil is supersaturated with moisture from whatever source derived.”

With reference to para. 4 of Government of India No. 85, dated Simla, 22nd May 1880, to address of Secretary to Government, Punjab, *viz*: that this Department should specially notice in future reports, the effect of the remedial measures taken by the Canal authorities on the disproportion between births and deaths in this tract, I have to add that I was not aware that the Canal Department was entrusted with any special remedial measures for this purpose, and accordingly made enquiries on the subject from the Secretary to Government, P. W. D., Irrigation Branch, and subjoin his reply herewith with its annexure showing the action taken in regard to the drainage of the selected locality.

COPY of a letter No. 2357 I, dated 13th April 1883, from the Joint-Secretary to Government, Punjab, to the Sanitary Commissioner, Punjab.

With reference to his No. 685 of 5th April 1883, undersigned is desired to state that orders were passed as lately as 11th February 1882, on a general scheme for the drainage of the tracts affected by percolation from the Western Jamna Canal. The scheme also includes the opening up of all drainage lines which had been in any way interrupted by natural or artificial causes.

2. Undersigned is to append a printed copy of this office No. 621 I. of 11th February 1882, to address of Secretary to Government, Punjab, Civil Department, and to request attention to remarks on margin to paragraph 24 *et sequitur*, which show the present state of the works.

3. It may be generally stated that the completion of the drainage works must await that of the new system of distributaries, which is now far advanced.

Proposed Drainage Lines.

24. *Para. 12—Drainage Line No. I.* is proposed for the purpose of draining the city and station of Karnál and surrounding swamps. This project for this line has been received, and was returned with a note which will enable it to be resubmitted with estimate complete.—[In hand]

25. *Drainage Line No. II.*—Mr. Oliver proposes two alternative lines from Rer, and a third which would leave the *khadir* untouched, and which, instead of having a direct outfall into the Jamna, would throw the drainage water into the jhils at Gohána, to be from thence conveyed by the enlargement of the cut (No. IV. below) by the Bowána escape channel into the Jamna. The first of the alternatives from Rer has, with the exception that the line does not take up any parts of the deep nallah, been accepted. A project and estimate have been submitted, and returned with a note, from which a complete estimate can be drawn out. The cut as now proposed will, to a certain extent, be available as a canal escape. It will also take up the drainage water of a considerable area in which the canal is not concerned. The reasons for rejecting the other two alternatives are, that the cut on the line of the proposed Panipat escape will not include the drainage which it was intended that the old Rer escape should take up, and as this drainage has once been interfered with, it must of necessity be considered in any future scheme. The reasons for differing with Mr. Oliver's advocacy of the Gohána scheme are, that it would entail the enlargement of an artificial cut on a line, which has a very small available slope; that the effect of throwing extra water even for a short time into the jhils at Gohána cannot be accurately measured, but may be disastrous; and, further, that taking a quantity of drainage so far inland only to bring it back on another line is an unscientific way of disposing of it.—[Survey made. Estimate returned for correction.]

26. *Drainage Line No. III.*—Comprises the clearance and demarcation of the old channel of the Nye nallah, taking the water under the New Hansi Branch above Safidon, and discharging through the jhils at Gohána into Main Drain No. IV., which is described below; the marking out and plans of this drainage are said to be in hand.—[Report received. Orders will be passed shortly.]

27. *Drainage Cut No. IV.*, which has been alluded to above in connection with II. and III., is on the line of the old Bádsháhi Canal from Gohána to Jatana on the present Delhi Canal down this line to near Gangatauli where it passes out through the present Bowána escape head, and under the aqueduct on the New Delhi Branch to the Jamna. On his sheet 5 Mr. Oliver gives a longitudinal section down the old Bádsháhi Canal and part of the Delhi Canal and escape, and shows that there is a slope of only 0.5 per mile available as far as the sill of the Bowána escape head. The Bádsháhi Canal crosses the cuts from the Júh jhíl and from Bhatgáon, which will thus be intercepted by this cut, No. IV., and I would propose increasing the slope from the crossing of the Júh drainage. This can be done by lowering the crest of the Bowána escape head in the old Delhi Canal where there is an overfall of some 14 feet. The object of this increase of slope is to put the bed of the cut more within soil, and to lessen its width and cost. From the old escape head to the Jamna there is ample slope. With reference to this cut, His Honor remarks that he considers it the most important of all the lines of drainage, and that it should receive early attention.—[Cannot be put in hand until distributaries, which are in hand, have been completed.]

28. *Drainage No. V.*—Contemplates the removal of obstructions in the Gundah nallah in the *khadir* below Pánipat, and its connection with the nallah which falls into the Jamna at Khojápúr. The course of the nallah will have to be straightened in a few places to increase the slope. This scheme, Mr. Oliver says, would perfectly drain Pánipat.

This line is outside irrigated limits, and the canal is not concerned in it.—[This is being worked in connection with Drainage No. II.]

29. *Drainage No. VI.*—This drain is also in the *khadir*, and is very slightly affected by canal irrigation and drainage. Mr. Oliver in a separate note on Civil Secretary's No. 1250, dated 18th November 1881, which conveyed His Honor's remarks on this drainage cut, says that below Sonapat the *khadir* drainage is influenced by the Bowána escape, and below Alipur (the head of the Bowána escape) several of the *khadir* villages are more or less irrigated. I may mention that the proposed tail of No. IV. drainage will be a rectification of the alignment and levels of the old Bowána escape, and that the drainage of the villages below Alipur will be taken up by this tail, so that with the exception of the east Júh drainage which it is proposed (in the printed note, page 30) to take into this No. VI. drain near Pitampura, No. VI. drain will be unaffected by the canal. It is, as remarked by His Honor, a long line, but there is no fair outlet for the waters higher up than the place where Mr. Oliver has located the tail, and past experience of cuts in the *khadir* has shown that they must slant across and make a very small angle with the course of the river, or the river floods will back up and close the mouth of the cut with silt. Mr. Oliver proposes to take advantage of the natural drainages as much as possible, (the deep channels are all of them near the high bank), and to improve them where very tortuous by short artificial cuts. The outfall of the drainage will be made in connection with that proposed for drain No. IV. and the new Bowána (Daryápur) escape, and they will all flow into the river together.—[Not touched]

30. *Drainage Cut No. VII.*—Is the continuation of the Júh and Bhatgáon cuts below the point where they are intercepted by the main drain, No. IV. I gather that nothing more is proposed to be done to these cuts (which were cleared to some extent by His Honor's orders in 1881) than the usual removal of obstacles, so that the water may find its way into the Najafgarh jhíl.—[Completed.]

31. *Drainage Cut No. VIII.*—Is the continuation of No. III., which is diverted into IV.; the work will consist of demarcating and, where necessary, clearing the course of the Nye nallah; the drainage ends in the sand hills below Rohtak.—[Not touched.]

32. *Drainages Nos. IX. and X.*—No. IX. lies between the Butána and proposed Beri Branches, and runs out into the sand. No. X. between the Beri (proposed) Branch and the Hánsi Canal. Nothing beyond demarcation is proposed, and even that seems to be hardly necessary at present.—[Not touched]

33. Para. 13 is divided into I., II. and III. The Swamps around Begampur and Razápur, above the new Rer drainage cut (No. II.) will be received by inlets into that cut, but channels must be made to the inlets. Those included under II. are quite minor drainage, and will receive due attention after the main drains are cleared. No. III. requires further investigation. — [No. I. is worked with main drain II. See para. 25.]

34. Para. 14. Requires no remark ; it merely states the length of the old canal which will be retained as drainage channels. It appears to be correct in the main, but is open to modification.

35. In conclusion, I am to say that His Honor looks upon this project as almost as important as the remodelling of the Western Jamna Canal, and desires that it may be carried out in a most thorough manner.

The usual statement showing the births and deaths registered in these villages during the year under review, is herewith appended.

Statement showing Births and Deaths registered in the villages situated on the

1	2	3	4			5			6			7		8					
			POPULATION AC- CORDING TO CENSUS OF 1877.			TOTAL NO. OF BIRTHS REGIS- TERED.			TOTAL NO. OF DEATHS REGIS- TERED.			Birth-rate per mille of population per annum.	Death-rate per mille of population per annum.	CAUSE OF DEATH.					
Number.	Districts.	NAME OF VILLAGES.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.			Cholera.	Small-pox.	Fevers.	Bowel com- plaints.	Injuries.	All other causes.
1	D E L H I.	Tajpur (Tihari Khurd) ...	214	205	419	10	14	24	11	9	20	57	48	...	...	13	...	...	7
2		Bathgaon ...	2,396	2,046	4,442	69	69	138	146	101	247	31	56	...	2	189	17	1	38
3		Barawasni ...	988	907	1,895	32	44	76	51	41	92	40	48	...	...	59	8	...	25
4		Mahra ...	873	773	1,646	44	33	77	28	40	68	47	41	...	...	35	3	...	30
5		Debarpur ...	253	203	456	11	12	23	18	12	30	50	66	...	...	26	...	...	4
6		Hulaheri ...	478	416	894	11	9	20	13	13	26	22	29	...	...	22	1	...	3
7		Garhi Brahmán ...	277	263	545	14	12	26	12	8	20	48	37	...	...	15	...	...	5
8		Bádshahpur Májri ...	196	181	377	7	3	10	10	4	14	26	37	...	...	12	...	...	2
9		Jáji ...	296	285	581	9	11	20	6	17	23	34	39	...	...	9	4	...	10
10		Kakrohi ...	1,089	1,020	2,109	51	52	103	53	49	102	49	48	...	...	76	2	2	22
11		Juan ...	1,563	1,476	3,039	70	63	133	58	51	109	44	36	...	...	84	...	1	24
12		Situali ...	432	403	835	19	12	31	33	22	55	37	66	...	...	46	...	...	9
13		Chitánah ...	442	393	835	24	14	38	19	16	35	45	42	...	...	21	3	...	11
14		Kheri Darya ...	332	304	636	16	8	24	15	10	25	38	39	...	...	18	2	1	4
15		Jafarabád ...	249	227	476	13	5	18	16	9	25	38	52	...	...	19	...	...	6
16		Khizarpur Ját ...	218	191	409	4	5	9	14	5	19	22	46	...	...	17	...	...	2
17		Máihlana ...	614	537	1,151	34	25	59	27	18	45	51	39	...	...	41	...	...	4
18		Kareori ...	403	353	756	11	12	23	28	17	45	30	59	...	...	37	...	...	8
19		Hassanyárpur (Tihari Kalán) ...	217	188	405	6	4	10	11	12	23	25	57	...	...	15	4	...	4
20		Bágru ...	381	322	703	12	11	23	7	15	22	33	31	...	...	16	3	...	3
21		Jharauti ...	261	253	514	8	9	17	12	11	23	33	45	...	1	12	...	1	9
22		Anandpur ...	151	136	287	7	7	14	7	8	15	49	52	...	...	10	...	...	5
23		Bhadhánah ...	648	585	1,233	18	16	34	41	24	65	27	53	...	...	52	2	...	11
24		Jharant ...	318	261	579	15	12	27	14	11	25	47	43	...	...	21	...	...	4
25		Rohát ...	1,468	1,293	2,761	56	53	109	67	57	124	39	45	...	...	81	...	1	42
		Total ...	14,757	13,226	27,983	571	515	1,086	717	580	1,297	39	46	...	3	946	49	7	292
1	K A R N A L.	Kharkali ...	72	50	122	2	3	5	2	2	4	41	33	...	...	3	...	...	1
2		Jhiwarheri ...	187	160	347	9	13	22	10	9	19	63	55	...	...	14	...	...	5
3		Hassanpur ...	207	190	397	15	12	27	8	4	12	68	30	...	...	10	...	1	1
4		Basin ...	222	199	421	10	7	17	10	4	14	40	23	...	...	9	...	...	5
5		Phorlak ...	684	700	1,384	38	33	71	36	34	70	51	50	...	...	63	...	...	7
6		Opli ...	36	44	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7		Garaundah ...	2,061	1,568	3,629	113	96	209	50	51	101	57	28	...	3	49	...	1	48
8		Malakpur ...	89	63	152	2	...	2	2	1	3	13	20	...	...	1	...	...	2
9		Bádshahpur ...	31	20	51	2	2	4	1	1	2	78	39	...	...	1	...	...	1
10		Ghora Gharri ...	89	75	164	4	7	11	3	6	9	67	55	...	...	4	1	...	4
11		Sheikhpura ...	395	379	774	23	22	45	17	12	29	58	37	...	...	24	...	...	5
12		Godah ...	627	551	1,178	18	8	26	15	12	27	22	23	...	1	20	...	...	6
13		Kohand ...	651	501	1,152	22	23	45	10	14	24	39	21	...	...	9	1	1	13
14		Ganjar ...	311	249	560	10	5	15	21	4	25	27	45	...	...	20	4	...	1
15		Barauli ...	406	361	767	19	8	27	9	10	19	35	25	...	1	18	...	...	...
16		Babarpur ...	202	183	385	10	9	19	11	14	25	49	65	...	2	16	1	...	6
17		Begampur ...	127	122	249	11	5	16	12	9	21	64	84	...	...	9	1	1	10
18		Dolánah ...	494	438	932	20	28	48	29	23	52	51	56	...	...	32	2	...	18
19		Kotánah ...	40	27	67	2	8	10	...	2	2	149	28	...	...	...	...	...	2
20		Baholi ...	363	235	598	14	14	28	14	10	24	47	40	...	...	22	...	2	...
21		Razápur ...	88	35	123	...	2	2	8	3	11	16	89	...	...	10	...	...	1
22		Khacroli ...	532	458	990	21	18	39	17	13	30	39	30	...	...	25	...	...	5
23		Muhammadpur ...	340	291	631	15	9	24	19	24	43	38	68	...	4	36	...	...	3
		Total ...	8,254	6,899	15,153	380	332	712	304	262	566	47	37	...	11	395	10	6	144

Western Jamna Canal in the Delhi and Karnál Districts during the year 1882.

9																		10												11																
AGES AT DEATHS.																		DEATHS BY MONTHS.																												
Under 1 year.		1 and Under 5.		5 and under 10.		10 and under 15.		15 and under 20.		20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Number.		
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.																											
2	4	2	1	1	...	3	1	2	1	1	...	1	1	...	3	1	3	2	1	1	1	2	2	4	1	1	
26	16	8	11	4	7	4	2	9	6	19	10	24	10	19	17	15	7	18	15	25	19	22	10	24	18	21	15	20	17	27	29	2		
9	6	9	6	...	4	...	3	1	1	4	1	3	7	12	5	8	4	5	4	9	3	13	7	13	9	1	6	6	5	12	8	3		
10	9	3	2	...	1	...	1	...	1	5	2	5	6	...	4	2	9	3	3	7	6	3	3	8	6	4	4	8	7	7	5	4		
4	4	2	...	2	2	...	3	1	1	1	2	2	...	3	2	1	2	1	1	...	1	5	3	2	2	2	5	6	5	
2	3	2	1	...	1	1	...	1	1	1	1	2	2	1	2	3	2	...	1	3	...	3	6	2	4	1	1	...	5	6		
4	2	1	1	2	1	3	4	1	...	1	...	1	2	1	2	1	2	3	2	2	4	7		
1	1	1	1	1	2	...	2	1	2	1	1	...	2	1	3	1	2	1	1	2	1	8		
3	7	1	1	1	...	2	1	2	...	2	1	2	1	1	1	...	2	3	1	6	...	3	3	2	9		
12	9	3	7	1	2	3	1	2	1	8	6	7	2	7	6	3	8	7	7	10	7	4	6	12	9	5	8	9	7	1	14	10		
15	16	3	4	2	3	1	...	5	...	7	3	6	8	8	7	5	4	6	6	11	11	12	13	12	8	3	4	6	6	8	15	11		
5	4	...	1	...	1	3	...	5	3	14	4	2	4	3	3	1	2	7	2	4	2	6	8	4	1	1	8	4	8	12		
7	1	1	1	...	1	3	2	...	4	2	2	1	1	3	2	2	2	2	6	7	3	6	4	1	1	...	1	3	1	13		
5	1	1	1	...	1	...	1	2	1	1	1	4	2	...	2	2	...	2	3	1	2	1	1	2	5	2	3	3	14			
5	1	1	...	1	1	...	1	...	1	3	1	1	...	1	2	4	2	...	2	4	3	2	1	3	1	4	5	15		
3	1	3	...	1	...	2	2	2	1	1	1	1	1	2	2	1	...	4	1	2	3	2	2	16		
8	3	2	1	...	2	2	...	3	2	3	5	2	2	...	2	5	3	7	2	3	2	7	4	3	5	3	1	5	3	17		
3	4	...	2	1	1	1	1	8	2	8	1	...	3	7	2	...	1	4	4	1	7	1	6	2	1	5	2	8	4	18		
1	2	...	1	...	1	...	1	1	1	4	2	3	1	2	2	...	1	1	2	3	2	...	1	1	4	5	4	19		
1	5	2	1	2	1	...	3	...	1	...	1	2	3	1	2	1	...	2	3	5	3	3	2	20		
2	4	1	2	1	2	1	2	2	4	1	1	2	3	3	3	1	1	2	2	1	3	2	21		
3	4	1	1	1	1	1	2	1	3	1	1	5	3	2	22		
7	5	1	2	1	3	4	...	9	5	10	2	2	3	4	1	3	3	7	10	5	10	5	4	3	5	3	6	2	5	23		
7	1	...	1	1	2	...	3	3	1	...	2	1	3	2	...	2	1	4	2	2	...	3	1	3	5	24		
20	23	3	5	4	2	...	8	2	7	4	14	2	4	8	5	13	14	11	7	9	9	13	8	9	9	8	14	13	25		
165	135	43	46	21	30	14	11	45	16	95	25	110	72	88	72	60	67	76	79	120	99	109	87	133	116	72	79	92	94	143	153		
1	1	1	1	3	1	1	
3	3	...	1	1	2	3	2	1	1	1	...	1	...	4	2	2	3	1	3	...	3	1	2	
3	1	1	1	2	1	1	1	1	...	1	1	...	2	...	2	1	2	...	1	...	2	3	
7	1	2	1	1	1	...	1	1	1	1	2	...	2	...	2	1	1	1	2	4	
7	6	5	3	2	...	1	6	4	6	2	4	5	6	7	2	4	...	6	7	5	6	4	4	4	3	6	6	7	12	5		
...
17	18	8	10	...	4	1	2	...	3	4	2	1	3	8	...	2	2	9	7	12	3	1	2	9	11	13	13	11	9	10	7	7	
1	...	1	1	2	...	1
1	1	1	1
1	4	1	1	2	...	1	1	1	1	2	1	...	2	10	
5	6	2	...	1	3	2	3	2	3	1	...	1	2	1	2	5	1	4	1	3	3	2	4	1	11				

VITAL STATISTICS
OF THE
GENERAL POPULATION, 1882.

BIRTHS REGISTERED in the DISTRICTS of the PUNJAB during the year 1882.

1 Number.	2 DISTRICTS.	3 Population according to Census of 1881.			4 Number of births registered.			5 Ratio of births per 1,000 of population.			6 Number of males born to every 100 females born.	7 Excess of births over deaths per 1,000 of population.	8 Excess of deaths over births per 1,000 of population.
		Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.			
	DELHI DIVISION.												
1	Delhi	344,016	299,499	643,515	13,935	12,312	26,247	21·65	19·13	40·79	113·18	10	..
2	Gurgaon	338,917	302,931	641,848	12,397	10,645	23,042	19·31	16·58	35·90	116·46	9	..
3	Karnál	336,171	286,450	622,621	13,590	11,934	25,524	21·83	19·17	40·99	113·88	9	..
	HISSAR DIVISION.												
4	Hissar	272,267	231,916	504,183	10,106	8,627	18,733	20·04	17·11	37·15	117·14	17	..
5	Rohtak	296,224	257,385	553,609	11,647	9,961	21,608	21·04	17·99	39·03	116·93	13	..
6	Sirsa	138,691	114,584	253,275	4,787	3,978	8,765	18·90	15·71	34·61	120·34	15	..
	UMBALLA DIVISION.												
7	Umballa	588,272	478,991	1,067,263	18,703	15,880	34,583	17·52	14·88	32·40	117·78	5	..
8	Ludhiána	339,598	279,237	618,835	12,372	10,844	23,216	19·99	17·52	37·51	114·09	14	..
9	Simla	27,593	15,352	42,945	268	213	481	6·24	4·96	11·20	125·82	...	5
	JULLUNDUR DIVN.												
10	Jullundur	431,435	358,120	789,555	16,564	14,721	31,285	20·98	18·64	39·62	112·52	19	..
11	Hoshiárpur	481,526	419,855	901,381	18,000	16,212	34,212	19·97	17·98	37·95	111·03	14	..
12	Kángra	380,867	349,978	730,845	11,416	10,514	21,930	15·62	14·39	30·01	108·58	3	..
	AMRITSAR DIVN.												
13	Amritsar	490,694	402,572	893,266	18,379	16,100	34,479	20·57	18·02	38·60	114·15	12	..
14	Gurdáspur	445,798	377,897	823,695	18,213	16,101	34,314	22·11	19·55	41·66	113·12	16	..
15	Siálkot	539,661	472,487	1,012,148	24,238	21,036	45,274	23·95	20·78	44·73	115·22	21	..
	LAHORE DIVISION.												
16	Lahore	510,353	413,753	924,106	19,148	16,792	35,940	20·72	18·17	38·89	114·03	11	..
17	Gujránwála	333,605	283,287	616,892	14,293	12,470	26,763	23·17	20·21	43·38	114·62	19	..
18	Ferozepore	357,319	293,200	650,519	13,032	11,230	24,262	20·03	17·26	37·30	116·05	15	..
	RAWALPINDI DIVN.												
19	Rawalpindi	449,287	371,225	820,512	15,250	13,248	28,498	18·58	16·15	34·73	115·11	4	..
20	Jhelum	313,448	275,925	589,373	10,337	8,944	19,281	17·54	15·17	32·71	115·57	...	..
21	Gujrát	362,162	326,953	689,115	15,542	13,732	29,274	22·55	19·93	42·48	113·18	21	..
22	Shahpur	221,676	199,832	421,508	9,245	8,045	17,290	21·93	19·09	41·02	114·92	1	..
	MOOLTAN DIVISION.												
23	Mooltan	304,517	247,447	551,964	9,694	8,348	18,042	17·56	15·12	32·69	116·12	...	3
24	Jhang	214,382	180,914	395,296	8,916	7,828	16,744	22·55	19·80	42·36	113·90	9	..
25	Montgomery	232,947	193,582	426,529	7,719	6,618	14,337	18·10	15·51	33·61	116·64	11	..
26	Muzaffargarh	184,510	154,095	338,605	7,352	6,644	13,996	21·71	19·62	41·33	110·66	...	4
	DERAJAT DIVISION.												
27	Dera Ismail Khan	238,468	203,181	441,649	7,762	5,838	13,600	17·57	13·22	30·79	132·96	...	..
28	Dera Gházi Khan	200,667	162,679	363,346	4,517	3,248	7,765	12·43	8·94	21·37	139·07	...	7
29	Bannu	177,503	155,074	332,577	5,951	4,462	10,413	17·89	13·42	31·31	133·37	5	..
	PESHAWAR DIVN.												
30	Pesháwar	329,524	263,150	592,674	7,033	4,174	11,207	11·87	7·04	18·91	168·49	2	..
31	Hazára	218,616	188,459	407,075	8,405	7,072	15,477	20·65	17·37	38·02	118·85	14	..
32	Kohát	101,369	80,171	181,540	2,325	1,617	3,942	12·81	8·91	21·71	143·78	5	..
	Total	10,202,083	8,640,181	18,842,264	371,136	319,388	690,524	19·70	16·95	36·65	116·20	10	..

DEATHS REGISTERED in the DISTRICTS of the PUNJAB during the year 1882.

1	2	3	4	5	6			7	8			9			
Number.	DISTRICTS.	Population according to Census of 1881.	Area in square miles.*	Average population per square mile.	Number of deaths registered			No. of male died to every 100 deaths of females.	Ratio of deaths per 1,000 of population			Mean Ratio of deaths per 1,000 during previous 5 years.			
					Males.	Females.	Total.		Males.	Females.	Total.	Males.	Females.	Total.	
	DELHI DIVISION.														
1	Delhi	643,515	1,276	504	10,889	9,233	20,122	117·93	32	31	31	45	45	45	
2	Gurgaon	641,848	1,938	331	9,469	7,842	17,311	120·75	28	26	27	45	42	44	
3	Karnál	622,621	2,396	260	10,903	8,856	19,759	123·11	32	31	32	41	38	40	
	HISSAR DIVISION.														
4	Hissar	504,183	3,540	143	5,647	4,622	10,269	122·18	21	20	20	25	25	25	
5	Rohtak	553,609	1,811	306	7,837	6,374	14,211	122·95	26	25	26	37	36	36	
6	Sirsa	253,275	3,004	84	2,783	2,183	4,966	127·48	20	19	20	26	27	27	
	UMBALLA DIVISION.														
7	Umballa	1,067,263	2,570	415	15,414	13,037	28,451	118·23	26	27	27	31	29	30	
8	Ludhiána	618,835	1,375	450	7,703	6,798	14,501	113·31	23	24	23	31	32	31	
9	Simla	42,945	18	2,386	404	281	685	143·77	15	18	16	21	24	22	
	JULLUNDUR DIVN.														
10	Jullundur	789,555	1,322	597	8,805	8,034	16,839	109·60	20	22	21	36	38	37	
11	Hoshiárpur	901,381	2,180	413	11,782	10,338	22,120	113·97	24	25	24	30	31	31	
12	Kángra	730,845	9,069	81	10,862	9,297	20,159	116·83	28	26	27	28	27	27	
	AMRITSAR DIVN.														
13	Amritsar	893,266	1,574	567	12,894	11,210	24,104	115·02	26	28	27	37	40	39	
14	Gurdáspur	823,695	1,822	452	12,053	9,823	21,876	122·70	27	26	26	28	29	28	
15	Siálkot	1,012,148	1,958	517	13,246	11,023	24,269	120·17	24	23	24	24	22	23	
	LAHORE DIVISION.														
16	Lahore	924,106	3,648	253	13,933	12,066	26,049	115·89	27	29	28	37	37	37	
17	Gujránwála	616,892	2,587	238	7,928	6,740	14,668	117·63	24	24	24	28	30	29	
18	Ferozepore	650,519	2,752	236	7,769	6,456	14,225	120·34	22	22	22	28	27	28	
	RAWALPINDI DIVISION.														
19	Rawalpindi	820,512	6,218	132	13,142	12,152	25,294	108·15	29	33	31	37	35	36	
20	Jhelum	589,373	3,910	151	10,049	9,579	19,628	104·91	32	35	33	29	28	29	
21	Gujrát	689,115	1,973	349	7,849	6,920	14,769	113·42	22	21	21	26	25	26	
22	Shahpur	421,508	4,691	90	8,730	8,303	17,033	105·14	39	41	40	28	27	27	
	MOOLTAN DIVISION.														
23	Mooltan	551,964	5,880	94	10,928	9,202	20,130	118·76	36	37	36	27	25	26	
24	Jhang	395,296	5,702	69	6,745	6,195	12,940	108·88	31	34	33	15	15	15	
25	Montgomery	426,529	5,574	77	5,313	4,419	9,732	120·23	23	23	23	24	24	24	
26	Muzaffargarh	338,605	3,139	108	7,858	7,552	15,410	104·05	42	49	45	28	27	28	
	DERAJAT DIVISION.														
27	Dera Ismail Khan	441,649	9,296	47	7,360	6,362	13,722	115·69	31	31	31	24	22	23	
28	Dera Gházi Khan	363,346	4,517	80	5,645	4,519	10,164	124·92	28	28	28	17	15	16	
29	Bannu	332,577	3,868	86	4,604	3,951	8,555	116·53	26	25	26	24	21	22	
	PESHAWAR DIVN.														
30	Pesháwar	592,674	2,504	237	5,583	4,367	9,950	127·84	17	16	17	22	19	21	
31	Hazára	407,075	3,039	134	5,090	4,620	9,710	110·17	23	24	24	22	17	20	
32	Kohát	181,540	2,838	64	1,751	1,427	3,178	122·70	17	18	17	17	13	15	
	Total for the Province	18,842,264	107,989	175	271,018	233,781	504,799	111·65	26	27	27	30	30	30	

* NOTE.—The figures in column 4 have been taken from the Census Forms of 1881.

DEATHS REGISTERED in the DISTRICTS of the PUNJAB during each month of the year 1882.

1	2	3												4	5
Number.	DISTRICTS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Deaths registered during the year.	Number.
DELHI DIVISION.															
1	Delhi	1,978	1,464	1,617	1,820	1,996	1,645	1,223	1,329	1,680	1,420	1,814	2,136	20,122	1
2	Gurgaon	1,662	1,185	1,223	1,291	1,399	1,260	1,046	1,221	1,804	1,478	1,575	2,167	17,311	2
3	Karnál	1,784	1,297	1,619	1,241	1,824	2,113	1,331	1,623	2,015	1,382	1,585	1,945	19,759	3
HISSAR DIVISION.															
4	Hissar	853	587	713	715	826	860	698	1,044	1,167	842	962	1,002	10,269	4
5	Rohtak	1,093	807	970	979	1,165	1,145	995	1,201	1,573	1,169	1,232	1,882	14,211	5
6	Sirsa	419	352	397	401	448	366	328	508	413	491	410	435	4,966	6
UMBALLA DIVISION.															
7	Umballa	2,533	1,613	1,811	2,064	2,321	2,560	2,100	2,086	3,242	2,647	2,436	3,038	28,451	7
8	Ludhiána	1,005	708	809	778	960	1,042	969	1,221	1,484	1,677	1,912	1,936	14,501	8
9	Simla	46	46	54	41	57	61	67	47	85	67	49	65	685	9
JULLUNDUR DIVN.															
10	Jullundur	1,490	1,072	1,117	971	1,259	1,160	1,130	1,378	1,641	1,594	1,840	2,187	16,839	10
11	Hoshiárpur	1,848	1,367	1,549	1,246	1,922	1,672	1,307	1,915	2,329	2,183	2,381	2,401	22,120	11
12	Kángra	1,973	1,469	1,492	1,527	1,891	1,731	1,410	1,553	1,963	1,793	1,590	1,767	20,159	12
AMRITSAR DIVN.															
13	Amritsar	2,151	1,474	1,483	1,300	1,753	1,855	1,553	1,790	2,031	2,698	2,985	3,031	24,104	13
14	Gurdáspur	2,034	1,347	1,401	1,183	1,640	1,512	1,480	1,622	2,114	2,329	2,417	2,797	21,876	14
15	Siálkot	2,114	1,446	1,281	1,163	1,949	1,780	1,662	1,840	2,285	2,743	2,744	3,262	24,269	15
LAHORE DIVISION.															
16	Lahore	2,433	1,605	1,501	1,378	1,785	1,645	1,312	1,667	2,059	3,006	3,587	4,071	26,049	16
17	Gujránwála	1,043	715	763	600	1,050	1,101	1,001	1,134	1,251	1,750	1,992	2,268	14,668	17
18	Ferozepore	982	700	732	788	795	874	870	1,356	1,554	1,875	1,757	1,942	14,225	18
RAWALPINDI DIVN.															
19	Rawalpindi	1,803	1,394	1,457	1,242	1,382	1,351	1,331	1,626	1,874	2,810	4,957	4,067	25,294	19
20	Jhelum	932	748	746	801	805	799	807	1,026	1,463	2,299	5,075	4,127	19,628	20
21	Gujrát	1,053	887	812	818	1,014	1,003	1,003	1,138	1,428	1,569	1,942	2,104	14,769	21
22	Shahpur	794	621	703	590	677	770	561	811	1,335	2,711	4,167	3,293	17,033	22
MOOLTAN DIVISION.															
23	Mooltan	1,527	1,139	1,034	1,007	973	817	823	910	2,150	3,295	3,115	3,340	20,130	23
24	Jhang	682	607	648	537	582	568	529	660	1,168	2,101	2,612	2,246	12,940	24
25	Montgomery	1,205	710	645	557	712	570	548	557	697	988	1,151	1,392	9,732	25
26	Muzaffargarh	732	640	693	563	684	534	466	698	1,791	3,580	3,144	1,885	15,410	26
DERAJAT DIVISION.															
27	Dera Ismail Khan	717	698	728	787	561	580	526	581	1,336	2,333	2,437	2,438	13,722	27
28	Dera Gházi Khan	443	348	395	422	395	411	306	422	1,372	2,417	1,725	1,508	10,164	28
29	Bannu	545	493	512	510	398	426	493	495	784	979	1,523	1,397	8,555	29
PESHÁWAR DIVN.															
30	Pesháwar	994	768	825	833	708	812	753	566	731	738	999	1,223	9,950	30
31	Hazára	831	757	687	507	580	530	583	843	1,133	1,026	971	1,262	9,710	31
32	Kohát	324	244	227	248	189	191	165	166	210	329	409	476	3,178	32
Total for the Province ..		40,023	29,308	30,644	28,908	34,700	33,744	29,376	35,032	48,160	58,319	67,495	69,090	504,799	
Ratio of deaths per 1,000 in each month ..		2.12	1.55	1.63	1.53	1.84	1.79	1.56	1.86	2.55	3.09	3.58	3.67	26.79	

DEATHS REGISTERED according to age in the DISTRICTS

1	2			3		4		5		6		7	
Number.	DISTRICTS.			Under one year.		One year and under 5.		5 and under 10.		10 and under 15.		15 and under 20.	
				Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
DELHI DIVISION.													
1	Delhi	...	...	3,085	2,490	1,703	1,509	478	360	279	227	292	254
2	Gurgaon	...	...	2,196	1,794	1,419	1,161	467	360	317	248	266	179
3	Karnál	...	...	3,140	2,376	1,530	1,258	424	348	232	190	239	188
HISSAR DIVISION.													
4	Hissar	...	...	1,307	940	1,074	857	322	268	157	162	131	130
5	Rohtak	...	...	2,380	1,800	1,296	1,099	393	290	166	123	180	116
6	Sirsa	...	...	647	534	432	355	145	136	104	68	76	58
UMBALLA DIVISION.													
7	Umballa	...	...	3,733	3,258	2,689	2,437	695	604	439	344	373	266
8	Ludhiána	...	...	2,504	2,418	1,636	1,318	317	264	159	149	151	111
9	Simla	...	...	90	45	22	38	10	10	8	11	13	14
JULLUNDUR DIVISION.													
10	Jullundur	...	...	2,957	2,886	1,429	1,428	266	248	215	197	161	169
11	Hoshiárpur	...	...	3,871	3,356	1,687	1,682	405	368	319	260	239	253
12	Kángra	...	...	2,695	2,356	897	804	381	325	312	279	336	375
AMRITSAR DIVISION.													
13	Amritsar	...	...	3,826	3,880	2,024	1,750	487	423	305	264	262	296
14	Gurdáspur	...	...	3,564	3,115	1,557	1,379	435	369	341	272	293	246
15	Siálkot	...	...	4,469	3,679	2,484	2,251	448	414	304	227	208	241
LAHORE DIVISION.													
16	Lahore	...	...	4,088	3,848	2,795	2,358	581	521	292	274	281	312
17	Gujránwála	...	...	2,666	2,224	1,634	1,432	345	234	194	137	129	136
18	Ferozepore	...	...	2,544	2,300	1,639	1,353	310	303	176	155	155	142
RAWALPINDI DIVISION.													
19	Rawalpindi	...	...	3,497	3,158	2,794	2,822	874	751	442	345	281	275
20	Jhelum	...	...	2,539	2,230	2,407	2,433	865	787	295	279	187	168
21	Gujrát	...	...	2,532	2,025	1,492	1,433	311	279	181	142	136	137
22	Shahpur	...	...	2,708	2,241	2,136	2,268	545	559	156	173	103	116
MOOLTAN DIVISION.													
23	Mooltan	...	...	2,929	2,705	1,567	1,465	442	365	220	191	209	162
24	Jhang	...	...	2,323	2,257	1,302	1,239	349	318	140	127	83	81
25	Montgomery	...	...	1,427	1,325	803	730	236	220	112	93	92	88
26	Muzaffargarh	...	...	2,617	2,589	1,588	1,684	301	280	126	123	116	105
DERAJAT DIVISION.													
27	Dera Ismail Khan	...	...	1,847	1,481	1,601	1,595	511	378	188	139	125	99
28	Dera Gházi Khan	...	...	1,155	894	1,502	1,178	451	342	136	111	76	59
29	Bannu	...	...	1,264	901	878	882	325	320	128	92	90	60
PESHAWAR DIVISION.													
30	Pesháwar	...	...	813	541	1,013	814	413	295	195	153	143	122
31	Hazára	...	...	1,493	1,184	693	651	317	299	216	175	124	107
32	Kohát	...	...	355	221	338	314	130	114	57	49	44	42
Total for the Province				77,261	67,051	48,061	43,977	12,979	11,152	6,911	5,779	5,594	5,098
Ratio per 1,000 living				238.56	217.97	51.14	49.41	9.13	9.31	5.56	6.29	6.17	6.89

of the PUNJAB during the year 1882.

8.		9		10		11		12		13		14
20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards.		TOTAL.		
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Number.
804	772	775	770	957	745	957	787	1,559	1,319	10,889	9,233	1
926	726	822	797	886	779	959	721	1,211	1,086	9,469	7,842	2
835	762	863	775	1,016	795	1,006	752	1,618	1,412	10,903	8,856	3
381	397	390	359	456	372	474	300	955	837	5,647	4,622	4
528	489	509	466	609	452	684	551	1,092	988	7,837	6,374	5
232	167	170	153	211	137	253	144	513	431	2,783	2,183	6
1,031	947	1,170	1,025	1,405	1,080	1,340	1,021	2,539	2,055	15,414	13,037	7
372	373	350	323	427	393	542	401	1,245	1,048	7,703	6,798	8
52	31	57	40	43	28	38	20	71	44	404	281	9
486	467	521	523	664	499	730	487	1,376	1,130	8,805	8,034	10
731	764	744	706	912	618	916	611	1,958	1,720	11,782	10,338	11
918	1,152	918	854	1,259	856	1,059	647	2,087	1,649	10,862	9,297	12
830	855	788	679	1,027	676	1,087	700	2,258	1,687	12,894	11,210	13
892	868	896	699	1,171	791	1,020	640	1,884	1,444	12,053	9,823	14
571	662	609	593	871	616	875	537	2,407	1,803	13,246	11,023	15
778	810	780	670	1,024	669	1,012	682	2,352	1,922	13,983	12,066	16
275	348	288	298	396	330	465	329	1,536	1,272	7,928	6,740	17
345	391	318	285	416	303	541	323	1,325	901	7,769	6,456	18
789	817	841	842	879	783	848	621	1,897	1,737	13,142	12,152	19
411	449	438	493	507	452	613	497	1,787	1,791	10,049	9,579	20
327	383	310	331	432	360	461	363	1,667	1,467	7,849	6,920	21
227	309	247	302	342	319	504	382	1,762	1,634	8,730	8,303	22
569	636	761	641	1,067	707	953	581	2,211	1,749	10,928	9,202	23
157	222	223	243	324	289	402	293	1,442	1,126	6,745	6,195	24
261	261	256	261	423	323	457	266	1,246	852	5,313	4,419	25
316	396	457	457	607	474	541	394	1,189	1,050	7,858	7,552	26
304	308	410	386	515	445	579	416	1,280	1,115	7,360	6,362	27
226	299	325	323	436	335	393	234	945	744	5,645	4,519	28
241	203	267	233	356	287	336	265	719	708	4,604	3,951	29
368	434	435	478	595	511	459	318	1,099	701	5,583	4,367	30
317	396	387	447	493	401	329	257	806	703	5,090	4,620	31
117	118	137	120	189	155	159	124	225	170	1,751	1,427	32
15,617	16,212	16,512	15,573	20,330	15,980	20,992	14,664	46,261	38,295	271,018	233,781	
9·03	10·51	11·98	13·33	20·73	18·46	31·60	28·12	78·27	78·46	26·56	27·06	

DEATHS REGISTERED according to CLASSES in the

1 Number.	2 DISTRICTS.						3 POPULATION ACCORDING TO CENSUS OF 1881.*				
							Muhamma- dans.	Hindus.	Native Chris- tians.	Other castes.	Total.
	DELHI DIVISION.										
1	Delhi	...	...	...	...	...	149,830	491,638	2,017	30	643,515
2	Gurgaon	...	...	...	...	...	198,610	443,168	70	...	641,848
3	Karnál	...	...	...	...	...	156,183	466,353	85	...	622,621
	HISSAR DIVISION.										
4	Hissar	...	...	...	...	...	113,517	390,611	55	...	504,183
5	Rohtak	...	...	...	...	...	79,510	474,064	31	1	553,609
6	Sirsa	...	...	...	...	...	93,289	159,969	17	...	253,275
	UMBALLA DIVISION.										
7	Umballa	...	...	...	...	...	304,123	759,361	3,773	6	1,067,263
8	Ludhiána	...	...	...	...	...	213,954	404,548	322	11	618,835
9	Simla	...	...	...	...	...	6,935	32,653	3,353	4	42,945
	JULLUNDUR DIVISION.										
10	Jullundur	...	...	...	...	...	358,601	429,302	1,631	21	789,555
11	Hoshiárpur	...	...	...	...	...	290,193	611,088	98	2	901,381
12	Kángra	...	...	...	...	...	39,148	688,506	327	2,864	730,845
	AMRITSAR DIVISION.										
13	Amritsar	...	...	...	...	...	413,207	479,180	869	10	893,266
14	Gurdáspur	...	...	...	...	...	391,400	431,832	463	...	823,695
15	Siálkot	...	...	...	...	...	669,712	340,894	1,535	7	1,012,148
	LAHORE DIVISION.										
16	Lahore	...	...	...	...	...	599,477	319,880	4,644	105	924,106
17	Gujránwála	...	...	...	...	...	452,640	164,058	194	...	616,892
18	Ferozepore	...	...	...	...	...	310,552	338,272	1,686	9	650,519
	RAWALPINDI DIVISION.										
19	Rawalpindi	...	...	...	...	...	711,546	104,975	3,822	169	820,512
20	Jhelum	...	...	...	...	...	516,745	72,195	416	17	589,373
21	Gujrát	...	...	...	...	...	607,525	81,335	255	...	689,115
22	Shahpur	...	...	...	...	...	357,742	63,737	29	...	421,508
	MOOLTAN DIVISION.										
23	Mooltan	...	...	...	...	...	435,901	114,133	1,861	69	551,964
24	Jhang	...	...	...	...	...	326,910	68,373	11	2	395,296
25	Montgomery	...	...	...	...	...	330,495	95,939	93	2	426,529
26	Muzaffargarh	...	...	...	...	...	292,476	46,096	33	...	338,605
	DERAJAT DIVISION.										
27	Dera Ismail Khan	...	...	...	...	...	385,244	56,139	253	13	441,649
28	Dera Gházi Khan	...	...	...	...	...	315,240	48,023	82	1	363,346
29	Bannu	...	...	...	...	...	301,002	31,493	82	...	332,577
	PESHAWAR DIVISION.										
30	Pesháwar	...	...	...	...	...	546,117	42,427	4,088	42	592,674
31	Hazára	...	...	...	...	...	385,759	21,224	90	2	407,075
32	Kohát	...	...	...	...	...	169,219	12,109	212	...	181,540
	Total for the Province						10,522,802	8,283,575	32,500	3,387	18,842,264

* These figures have been taken from the preliminary Census Statements of 1881.

DISTRICTS of the PUNJAB during the year 1882.

4					5					6
NUMBER OF DEATHS REGISTERED.					RATIO OF DEATHS PER 1,000 OF POPULATION.					Number.
Muhamma- dans.	Hindus.	Native Chris- tians.	Other castes.	Total.	Muhamma- dans.	Hindus.	Native Chris- tians.	Other castes.*	Total.	
5,123	12,623	13	2,363	20,122	34.19	25.67	6.44	...	31.27	1
5,749	8,954	1	2,607	17,311	28.95	20.20	14.28	...	26.97	2
5,273	11,717	...	2,769	19,759	33.76	25.12	...	...	31.73	3
2,235	6,607	1	1,426	10,269	19.69	16.91	18.18	...	20.37	4
2,084	10,195	...	1,932	14,211	26.21	21.50	...	...	25.67	5
1,964	2,258	...	744	4,966	21.05	14.11	...	...	19.61	6
8,285	15,456	...	4,710	28,451	27.24	20.35	...	...	26.66	7
5,324	7,411	...	1,766	14,501	24.88	18.31	...	...	23.43	8
143	376	1	165	685	20.62	11.51	0.30	...	15.95	9
7,445	6,857	3	2,534	16,839	20.76	15.97	1.84	...	21.33	10
7,523	11,474	...	3,123	22,120	25.92	18.78	...	...	24.54	11
1,319	16,308	1	2,531	20,159	33.69	23.69	3.06	883.73	27.58	12
11,351	10,216	1	2,536	24,104	27.47	21.32	1.15	...	26.98	13
10,474	8,785	1	2,616	21,876	26.76	20.34	2.16	...	26.56	14
15,210	6,418	2	2,639	24,269	22.71	18.83	1.30	...	23.98	15
16,615	7,137	10	2,287	26,049	27.71	22.31	2.15	...	28.19	16
10,139	3,440	...	1,089	14,668	22.40	20.97	...	...	23.78	17
6,978	5,617	...	1,630	14,225	22.47	16.60	...	...	21.87	18
22,589	2,632	1	72	25,294	31.75	25.07	0.26	426.03	30.83	19
17,319	2,290	...	19	19,628	33.51	31.72	...	...	33.30	20
12,931	1,753	...	85	14,769	21.28	21.55	...	...	21.43	21
13,815	3,050	...	168	17,033	38.62	47.85	...	...	40.41	22
16,093	3,616	...	421	20,130	36.92	31.68	...	...	36.47	23
10,109	2,440	...	391	12,409	30.92	35.69	...	...	32.73	24
7,080	2,234	...	418	9,732	21.42	23.28	...	...	22.82	25
13,131	2,076	...	203	15,410	44.89	45.04	...	...	45.51	26
11,999	1,666	...	57	13,722	31.15	29.68	...	...	31.07	27
8,494	1,632	...	38	10,164	26.94	33.98	...	...	27.97	28
7,733	812	1	9	8,555	25.69	25.78	12.19	...	25.72	29
9,503	395	1	51	9,950	17.40	9.31	0.24	...	16.79	30
9,205	496	...	9	9,710	23.86	23.37	...	...	23.85	31
3,080	88	...	10	3,178	18.20	7.27	...	...	17.50	32
286,315	177,029	37	41,418	504,799	27.21	21.37	1.14	...	26.79	

* The ratio of deaths amongst "other castes" is omitted, as the deaths are in excess of the population. See explanation given in para. 15, Section V of this Report.

DEATHS REGISTERED from different CAUSES in the DISTRICTS

1	2	3	4	5	6	7	INJURY	
Number.	A. DISTRICTS.	Population according to Census of 1881.	Cholera.	Small-pox.	Fevers.	Bowel-complaints.	Suicide.	
							Males.	Females.
	DELHI DIVISION.							
1	Delhi	460,193	...	48	8,195	398	2	10
2	Gurgaon	606,768	...	562	11,833	498	18	49
3	Karnál	558,162	2	487	11,658	353	1	1
	HISSAR DIVISION.							
4	Hissar	443,598	...	18	6,723	155	2	1
5	Rohtak	526,260	...	189	9,761	177	2	10
6	Sirsa	240,983	...	24	3,307	185	...	...
	UMBALLA DIVISION.							
7	Umballa	996,848	4	1,177	18,866	874	2	1
8	Ludhiána	557,799	2	133	7,980	263	1	8
9	Simla	30,640	...	...	141	76	...	1
	JULLUNDUR DIVISION.							
10	Jullundur	735,168	...	13	10,313	236	8	9
11	Hoshiárpur	877,823	...	20	13,954	823	4	12
12	Kángra	727,006	...	5	11,806	1,418	9	27
	AMRITSAR DIVISION.							
13	Amritsar	749,050	2	38	11,367	328	11	8
14	Gurdáspur	798,544	4	56	13,822	684	7	7
15	Siálkot	978,298	...	18	14,425	742	5	3
	LAHORE DIVISION.							
16	Lahore	767,892	2	119	14,792	306	4	8
17	Gujránwála	577,546	1	22	9,854	293	1	4
18	Ferozepore	629,649	1	92	8,679	298	6	4
	RAWALPINDI DIVISION.							
19	Rawalpindi	791,238	1	97	18,688	1,240	1	1
20	Jhelum	556,015	3	13	14,280	897	4	...
21	Gujrát	657,533	...	5	8,833	297	3	...
22	Shahpur	406,343	...	15	11,569	376	1	...
	MOOLTAN DIVISION.							
23	Mooltan	494,493	...	92	13,646	356	2	2
24	Jhang	371,991	...	4	8,240	230	1	...
25	Montgomery	426,529	...	193	6,608	182	3	...
26	Muzaffargarh	338,605	1	7	12,852	132	...	2
	DERAJAT DIVISION.							
27	Dera Ismail Khan	422,661	...	104	10,600	191	3	1
28	Dera Gházi Khan	343,659	...	89	8,527	111	1	2
29	Bannu	332,577	3	85	6,606	306	2	2
	PESHAWAR DIVISION.							
30	Pesháwar	533,382	...	618	6,394	96	1	1
31	Hazára	407,075	...	6	7,633	100	...	...
32	Kohát	168,050	...	286	2,093	56	1	...
	Total of Districts	17,512,378	26	4,635	324,045	12,677	106	174

NOTE.—A. Districts in this Statement do not include

and TOWNS of the PUNJAB during the year 1882.

8			9	10	11								12
RIES.			All other causes.	Total deaths from all causes.	RATIO OF DEATHS PER 1,000 OF POPULATION.								Number.
Wounding or accidents.	Snake-bite or killed by wild beasts.	Total.			Cholera.	Small-pox.	Fevers.	Bowel complaints.	Injuries.	All other causes.	From all causes.		
											For the year	Mean of previous 5 years.	
125	30	167	3,878	12,686	...	0·10	17·81	0·86	0·36	8·43	27	40	1
182	39	288	3,014	16,195	...	0·93	19·50	0·82	0·47	4·97	27	42	2
113	42	157	5,122	17,779	0·003	0·87	20·89	0·63	0·23	9·18	32	39	3
76	31	110	1,521	8,527	...	0·04	15·15	0·35	0·25	3·13	19	23	4
134	19	165	3,028	13,320	...	0·36	18·55	0·34	0·31	5·75	25	36	5
42	15	57	1,140	4,713	...	0·10	13·72	0·77	0·24	4·73	19	26	6
183	49	235	5,376	26,532	0·004	1·18	18·92	0·88	0·23	5·39	27	30	7
90	10	109	4,202	12,689	0·003	0·24	14·31	0·47	0·19	7·53	23	29	8
6	...	7	205	429	...	...	4·60	2·48	0·23	6·69	14	26	9
89	8	114	4,738	15,414	...	0·02	14·03	0·32	0·15	6·44	21	37	10
169	50	235	6,356	21,388	...	0·02	15·90	0·94	0·27	7·21	24	30	11
233	62	331	6,488	20,048	...	0·01	16·24	1·95	0·45	8·92	27	27	12
159	29	207	6,246	18,188	0·002	0·05	15·17	0·44	0·28	8·34	24	32	13
157	46	217	6,419	21,202	0·005	0·07	17·31	0·86	0·27	8·04	26	28	14
180	43	231	8,013	23,429	...	0·02	14·74	0·76	0·24	8·19	24	23	15
165	98	275	6,060	21,554	0·003	0·15	19·26	0·40	0·36	7·89	28	36	16
132	79	216	3,423	13,809	0·002	0·04	17·06	0·51	0·37	5·93	24	28	17
121	41	172	4,455	13,697	0·001	0·15	13·78	0·47	0·27	7·07	22	27	18
237	40	279	3,770	24,075	0·001	0·12	23·62	1·57	0·35	4·76	30	36	19
186	35	225	3,003	18,421	0·005	0·02	25·68	1·61	0·40	5·40	33	28	20
108	24	135	4,652	13,922	...	0·01	13·43	0·45	0·20	7·07	21	25	21
103	33	137	3,776	15,873	...	0·04	28·47	0·92	0·34	9·29	39	27	22
154	55	213	3,254	17,561	...	0·19	27·60	0·72	0·43	6·58	35	25	23
77	51	129	3,522	12,125	...	0·01	22·15	0·62	0·35	9·47	32	14	24
75	68	146	2,603	9,732	...	0·45	15·49	0·43	0·34	6·10	23	24	25
106	51	159	2,259	15,410	0·003	0·02	37·95	0·39	0·47	6·67	45	28	26
77	23	104	1,871	12,870	...	0·25	25·08	0·45	0·25	4·13	30	23	27
51	22	76	708	9,511	...	0·26	24·81	0·32	0·22	2·06	28	15	28
54	14	72	1,483	8,555	0·01	0·25	19·86	0·92	0·22	4·46	26	22	29
127	10	139	961	8,208	...	1·16	11·99	0·18	0·26	1·80	15	15	30
111	9	120	1,851	9,710	...	0·01	18·75	0·24	0·29	4·55	24	29	31
42	9	52	375	2,862	...	1·70	12·45	0·33	0·31	2·23	17	14	32
3,864	1,135	5,279	113,772	460,434	0·001	0·26	18·50	0·72	0·30	6·50	26	29	

the population and deaths of the principal Towns, Hill Sanitaria and Cantonments.

DEATHS REGISTERED from different CAUSES in the

1	2	3	4	5	6	7	INJU	
Number.	B. TOWNS.	Population accord- ing to Census of 1881.	Cholera.	Small-pox.	Fever.	Bowel-complaints.	Suicide.	
							Males.	Females.
DELHI DISTRICT.								
1	Delhi	117,363	3	243	2,966	165	3	3
2	Do. Suburbs	52,882	3	10	882	63	...	...
3	Sonepat	13,077	...	29	220	29	...	...
GURGAON DIST.								
4	Rewári	24,445	...	49	258	116	...	...
5	Palwal	10,635	...	1	229	56	...	...
KARNAL DIST.								
6	Karnál	23,133	1	33	292	96	...	...
7	Kaithal	14,754	...	24	111	49	...	...
8	Panipat	26,572	...	99	362	105	...	...
HISSAR DISTRICT.								
9	Hissar	14,167	...	...	181	41	...	...
10	Hánsi	12,656	...	8	201	24	...	...
11	Bhiwáni	33,762	...	7	293	109	...	...
ROHTAK DISTRICT.								
12	Rohtak	15,699	...	163	178	26	...	...
13	Jhajjar	11,650	2	82	151	22	...	...
SIRSA DISTRICT.								
14	Sirsa	12,292	...	1	121	16	1	...
UMBALLA DIST.								
15	Umballa	26,777	...	27	304	82	...	...
16	Jagádhri	12,300	2	5	134	37	...	...
17	Shahabad	10,218	...	23	106	22	...	...
18	Sádhaura	10,794	...	10	141	12	...	...
19	Rupar	10,326	...	6	90	19	...	...
LUDHIANA DIST.								
20	Ludhiána	44,163	...	...	632	76	...	...
21	Jagraon	16,873	...	...	197	68	...	...
JULLUNDUR DIST.								
22	Jullundur	31,177	...	...	333	68	...	...
23	Do. Suburbs	11,474	...	2	104	21	...	1
24	Ráhon	11,736	...	...	154	49	...	...
HOSHIARPUR DIST.								
25	Hoshiárpur	13,263	1	1	99	66	...	...
26	Urmar Tándá	10,295	...	...	223	46	...	1
AMRITSAR DIST.								
27	Amritsar	144,216	...	315	3,211	330	3	2
GURDASPUR DIST.								
28	Batála	24,281	...	2	354	44	...	...
SIALKOT DISTRICT.								
29	Siálkot	33,850	...	...	335	70	...	...
LAHORE DISTRICT.								
30	Lahore	97,208	1	447	1,991	56	2	...
31	Do. Suburbs	41,670	...	60	494	125	1	...
32	Kasur	17,336	...	3	166	36	...	...
GUJRANWALA DIST.								
33	Gujránwála	22,884	...	3	233	52	...	...
34	Wazirabad	16,462	...	...	215	13	...	...
FEROZEPUR DISTRICT.								
35	Ferozepore	20,870	...	...	250	62	1	...
RAWALPINDI DISTRICT.								
36	Rawalpindi	26,785	...	1	601	119	...	...
JHELUM DISTRICT.								
37	Jhelum	16,634	...	...	196	12	...	...
38	Pind Dádan Khan	16,724	...	1	672	90	...	...
GUJRAT DISTRICT.								
39	Gujrát	18,743	...	1	107	29	1	...
40	Jalalpur	12,839	...	...	204	61	...	...
SHAHPUR DISTRICT.								
41	Bhera	15,165	...	...	816	60	...	...
MOOLTAN DISTRICT.								
42	Mooltan	31,878	...	...	624	133	3	...
43	Do. Suburbs	25,593	...	...	727	95	1	...
JHANG DISTRICT.								
44	Maghiana	12,574	...	...	162	26	...	...
45	Chiniot	10,731	...	...	116	29	...	...
DERA ISMAIL KHAN DIST.								
46	Dera Ismail Khan	18,988	...	1	539	77	...	...
DERA GHAZI KHAN DIST.								
47	Dera Gházi Khan	19,687	...	...	408	45	...	...
PESHAWAR DISTRICT.								
48	Pesháwar	59,292	...	56	903	164	2	...
KOHAT DISTRICT.								
49	Kohát	13,490	...	30	169	12	1	...
Total of the Towns ...		1310,383	13	1,743	22,455	3,223	19	7
Total for the Province ...		18,842,264	39	6,379	346,674	15,965	126	181

DISTRICTS and TOWNS of the PUNJAB during the year 1882.

8			9	10	11											12
RIES.			All other causes.	Total deaths from all causes.	RATIO OF DEATHS PER 1,000 OF POPULATION.											Number.
Wounds or accidents.	Snake-bite or killed by wild beasts.	Total.			Cholera.	Small-pox.	Fevers.	Bowel-complaints.	Injuries.	All other causes.	From all causes.					
											For the year.	Mean of previous five years.				
56	3	65	2,176	5,618	0·02	2·07	25·27	1·40	0·55	18·54	48	65	1			
9	3	12	501	1,471	0·06	0·19	16·68	1·19	0·23	9·47				28	43	2
3	1	4	65	347	...	2·22	16·82	2·22	0·30	4·97				26	28	3
7	1	8	231	662	...	2·00	10·55	4·74	0·33	9·45	27	48	4			
4	2	6	162	454	...	0·09	21·53	5·26	0·56	15·23	43	77	5			
9	...	9	412	843	0·04	1·43	12·62	4·15	0·39	17·81	36	57	6			
2	1	3	80	267	...	1·63	7·52	3·32	0·20	5·42	18	30	7			
6	1	7	297	870	...	3·72	13·62	3·95	0·26	11·17	33	37	8			
2	1	3	277	502	...	...	12·78	2·89	0·21	19·55	35	44	9	
6	...	6	102	341	...	0·63	15·88	1·90	0·47	8·06	27	37	10			
2	2	4	486	899	...	0·21	8·68	3·23	0·12	14·39	27	35	11			
4	1	5	105	477	...	10·38	11·34	1·66	0·32	6·69	30	35	12			
2	...	2	155	414	0·17	7·04	12·96	1·89	0·17	13·30	35	43	13			
1	2	4	111	253	...	0·08	9·84	1·30	0·32	9·03	20	35	14			
12	1	13	466	892	...	1·01	11·35	3·06	0·48	17·40	33	44	15			
3	...	3	137	318	0·16	0·41	10·89	3·01	0·24	11·14	26	37	16			
2	...	2	74	227	...	2·25	10·37	2·15	0·19	7·24	22	30	17			
...	...	...	115	278	...	0·93	13·06	1·11	...	10·65	26	29	18	
3	...	3	86	204	...	0·58	8·71	1·84	0·29	8·33	20	29	19			
9	2	11	544	1,263	...	...	14·31	1·72	0·25	12·32	28	55	20	
...	...	...	284	549	...	...	11·67	4·03	...	16·83	32	49	21
8	2	10	462	873	...	...	10·68	2·18	0·32	14·82	28	47	22	
1	...	2	115	244	...	0·17	9·06	1·83	0·17	10·02	21	45	23			
4	...	4	101	308	...	...	13·12	4·17	0·34	8·60	26	39	24	
6	...	6	176	349	0·07	0·07	7·46	4·98	0·45	13·27	26	41	25			
...	1	2	112	383	...	...	21·66	4·47	0·19	10·88	37	37	26	
50	4	59	2,001	5,916	...	2·18	22·26	2·29	0·41	13·87	41	72	27			
5	2	7	242	649	...	0·08	14·58	1·81	0·29	9·97	27	26	28			
12	1	13	422	840	...	...	9·90	2·07	0·38	12·47	25	30	29	
30	5	37	570	3,102	0·01	4·60	20·48	0·58	0·38	5·86	32	45	30			
9	...	10	326	1,015	...	1·44	11·85	3·00	0·24	7·82	24	35	31			
5	1	6	167	378	...	0·17	9·57	2·08	0·35	9·63	22	28	32			
3	2	5	269	562	...	0·13	10·18	2·27	0·22	11·75	24	39	33			
2	...	2	67	297	...	...	13·06	0·79	0·12	4·07	18	33	34	
4	1	6	210	528	...	...	11·98	2·97	0·29	10·06	25	56	35	
9	1	10	437	1,168	...	0·04	22·44	4·44	0·37	16·31	44	78	36			
3	...	3	81	292	...	...	11·78	0·72	0·18	4·87	17	41	37	
6	...	6	146	915	...	0·06	40·18	5·38	0·36	8·73	55	38	38			
7	2	10	229	376	...	0·05	5·71	1·55	0·53	12·22	20	27	39			
2	...	2	204	471	...	...	15·89	4·75	0·15	15·89	37	38	40	
11	3	14	270	1,160	...	...	53·81	3·96	0·92	17·18	76	37	41	
18	1	22	515	1,294	...	...	19·57	4·17	0·69	16·15	40	34	42	
5	...	6	447	1,275	...	...	28·41	3·71	0·23	17·46	50	40	43	
1	1	2	235	425	...	...	12·88	2·07	0·16	18·69	34	26	44	
7	2	9	236	390	...	...	10·81	2·70	0·84	21·99	36	26	45	
4	2	6	229	852	...	0·05	28·39	4·05	0·31	12·06	45	33	46			
...	1	1	199	653	...	...	20·72	2·28	0·05	10·11	33	34	47	
18	3	23	596	1,742	...	0·94	15·23	2·76	0·39	10·05	29	61	48			
2	...	3	102	316	...	2·22	12·53	0·89	0·22	7·56	23	26	49			
374	56	456	16,032	43,922	0·01	1·33	17·14	2·46	0·35	12·23	33	47				
4,254	1,192	5,753	129,989	504,799	0·002	0·34	18·40	0·85	0·30	6·90	27	29				

DEATHS REGISTERED in the HILL SANITARIA and all CANTONMENTS of the PUNJAB PROVINCE during the year 1882.

PROVINCE OF PESHÁWAR.																		
Number.	Name of Hill Sanitaria and Cantonments.		Population.	Cholera.	Small-pox.	Fevers.	Bowel-complaints.	INJURIES.					All other causes.	Total deaths from all causes.	Ratio of deaths per 1,000 of population.	Total births registered during the year.	Ratio of births per 1,000 of population.	Number.
								Suicide.		Wounds or accidents.	Snake-bite or killed by wild beasts.	Total.						
								Males.	Females.									
HILL SANITARIA.																		
1	Simla	...	12,305	...	...	102	26	...	...	9	...	9	119	256	21	78	6	1
2	Dharmasála	...	3,839	...	1	40	27	...	...	...	...	...	43	111	29	87	23	2
3	Dalhousie	...	870	...	...	10	3	...	...	1	1	2	10	25	29	3	3	3
4	Murree	...	2,489	...	...	28	4	...	...	6	...	6	13	51	20	24	10	4
	Total	...	19,503	...	1	180	60	...	...	16	1	17	185	443	23	192	10	
CANTONMENTS.																		
1	Delhi	...	3,148	...	1	49	1	1	1	...	1	3	13	67	21	27	8	1
2	Umballa	...	40,686	...	...	334	7	...	...	...	1	1	279	621	15	777	19	2
3	Kasauli	...	3,010	...	...	31	5	...	...	3	...	3	15	54	18	31	10	3
4	Dagshai	...	2,633	...	...	40	3	...	...	2	...	2	11	56	21	61	23	4
5	Sabathu	...	2,376	...	...	24	3	...	...	1	...	1	27	55	23	56	23	5
6	Jutogh	...	953	...	...	9	3	...	...	...	...	...	3	15	16	10	10	6
7	Solan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
8	Jullundur	...	9,468	...	...	55	17	...	...	2	...	2	36	110	12	130	14	8
9	Dharmasála	...	1,483	...	...	61	1	...	1	...	...	1	11	74	50	38	26	9
10	Kángra	...	123	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10
11	Amritsar	...	1,231	...	...	11	...	...	...	1	...	1	1	13	10	6	5	11
12	Dalhousie	...	740	...	...	3	4	...	...	1	...	1	1	9	12	6	8	12
13	Bakloh	...	1,479	...	...	20	...	...	...	...	...	...	6	26	17	52	35	13
14	Siálkot	...	11,912	...	...	98	16	...	...	...	...	...	30	144	12	133	11	14
15	Mian Mir	...	18,409	...	1	198	28	...	1	3	1	5	29	261	14	126	7	15
16	Ferozepore	...	18,700	...	...	135	26	...	...	2	1	3	88	252	13	382	20	16
17	Rawalpindi	...	26,190	...	...	109	1	...	...	...	...	...	18	128	5	57	2	17
18	Murree	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18
19	Campbellpur	...	1,467	...	...	9	...	...	...	...	...	...	1	10	7	10	7	19
20	Attock	...	120	...	...	7	1	...	...	...	...	...	1	9	75	...	...	20
21	Jhelum	...	4,473	...	...	16	2	2	...	...	...	2	20	40	9	21	5	21
22	Tullagang	...	321	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22
23	Mooltan	...	11,203	...	...	107	1	...	...	1	...	1	104	213	19	55	5	23
24	Dera Ismail Khan	...	3,176	...	...	19	...	1	...	1	...	2	53	74	23	22	7	24
25	Dera Gházi Khan	...	2,367	...	...	35	4	...	...	...	...	...	37	76	32	39	16	25
26	Rajanpur	...	1,005	...	...	10	1	...	...	1	...	1	8	20	20	20	20	26
27	Edwardes-abad	...	3,700	...	...	15	...	...	...	1	...	1	76	92	25	26	7	27
28	Pesháwar	...	20,690	...	...	150	3	...	...	...	...	...	32	185	9	75	4	28
29	Nowshera	...	5,473	...	2	69	9	...	...	2	...	2	2	84	15	48	9	29
30	Mardan	...	2,766	...	...	15	...	...	...	2	...	2	15	32	11	38	14	30
31	Cherat	...	317	...	...	3	...	...	...	...	...	...	...	3	9	2	6	31
32	Abbottabad	...	2,381	...	...	6	...	...	...	...	...	...	72	78	33	46	19	32
33	Kohát	...	4,689	...	3	13	...	1	...	...	...	1	55	72	15	21	4	33
	Total	...	206,689	...	7	1,651	136	5	3	23	4	35	1,044	2,873	14	2,315	11	

DEATHS REGISTERED from CHOLERA in the DISTRICTS of the PUNJAB during each month of the year 1882.

1	2	3	4		5												6			7			8	9	
Number.	DISTRICTS.	Circles of registration.		Villages.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.			Mean Ratio per 1,000 of previous 5 years.	Number.
		Number in each district.	Number from which deaths from Cholera were reported.	Number in each district.	Number from which deaths from Cholera were reported.													Males.	Females.	Total.	Males.	Females.	Total.		
DELHI DIVN.																									
1	Delhi ..	15	1	743	2	3	..	..	..	..	..	..	1	2	..	..	..	3	3	6	0.01	0.01	0.1	0.20	1
2	Gurgaon ..	15	..	1,239	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.26	2
3	Karnal ..	14	2	868	3	..	..	2	..	..	..	1	..	..	..	..	..	2	1	3	0.005	0.003	0.004	0.57	3
HISSAR DIVN																									
4	Hissar ..	13	..	715	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.52	4
5	Rohtak ..	11	1	498	1	..	2	..	..	..	..	..	..	..	..	..	..	1	1	2	0.003	0.003	0.003	0.75	5
6	Sirsa ..	13	..	626	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.04	6
UMBALLA DIVISION.																									
7	Umballa ..	20	4	2,225	4	..	..	..	2	3	..	..	..	..	..	..	1	5	1	6	0.01	0.002	0.005	0.16	7
8	Ludhiāna ..	10	2	851	2	..	1	..	..	1	..	..	..	..	..	..	..	1	1	2	0.002	0.003	0.003	0.10	8
9	Simla ..	4	..	238	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.65	9
JULLUNDUR DIVISION.																									
10	Jullundur ..	10	..	1,233	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.24	10
11	Hoshiārpur ..	14	1	2,178	1	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1	0.002	..	0.001	0.09	11
12	Kāngra ..	15	..	704	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.56	12
AMRITSAR DIVISION.																									
13	Amritsar ..	10	2	1,078	2	..	..	..	..	1	..	..	1	..	..	..	..	2	..	2	0.004	..	0.002	0.38	13
14	Gurdāspur ..	17	4	2,302	4	..	1	..	1	1	..	..	1	..	..	..	..	2	2	4	0.004	0.005	0.004	0.08	14
15	Siālkot ..	13	..	2,315	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.07	15
LAHORE DIVN																									
16	Lahore ..	21	2	1,672	2	..	..	..	..	..	..	..	2	..	..	1	..	2	..	3	0.006	..	0.003	0.86	16
17	Gujranwāla ..	9	1	1,177	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	1	0.003	..	0.002	0.25	17
18	Ferozepore ..	15	1	1,276	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	1	0.003	..	0.001	0.74	18
RAWALPINDI DIVISION.																									
19	Rawalpindi ..	19	1	1,725	1	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1	0.002	..	0.001	0.87	19
20	Jhelum ..	13	3	1,042	3	..	..	..	..	..	1	2	..	..	..	..	..	2	1	3	0.006	0.004	0.005	0.79	20
21	Gujrat ..	9	..	1,416	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.14	21
22	Shahpur ..	15	..	632	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.10	22
MOOLTAN DIVISION.																									
23	Mooltan ..	14	..	1,233	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.001	23
24	Jhang ..	13	..	976	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.14	24
25	Montgomery ..	18	..	1,518	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.06	25
26	Muzaffargarh ..	13	1	534	1	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1	0.005	..	0.003	0.001	26
DERAJAT DIVISION.																									
27	Dera Ismail Khan ..	19	..	772	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.02	27
28	Dera Ghāzi Khan ..	17	..	422	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.001	28
29	Bannu ..	13	2	553	2	..	..	..	..	..	..	..	..	..	3	..	..	3	..	3	0.02	..	0.01	0.12	29
PESHAWAR DIVISION.																									
30	Peshāwar ..	18	..	730	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.47	30
31	Hazāra ..	15	..	1,013	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.43	31
32	Kohāt ..	11	..	469	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.89	32
Total for the Province ..		446	28	34,973	30	3	6	2	3	6	2	3	6	4	3	1	1	29	10	39	0.002	0.001	0.002	0.36	

DEATHS REGISTERED from SMALL-POX in the DISTRICTS of the

1	2				3		4		5					
Number.	DISTRICTS.				Circles of registration.		Villages.		January.	February.	March.	April.	May.	June.
					Number in each district.	Number from which deaths from Small-pox were reported.	Number in each district.	Number from which deaths from Small-pox were reported.						
DELHI DIVISION.														
1	Delhi	...	...	...	15	10	743	19	38	39	48	48	62	19
2	Gurgaon	...	...	...	15	15	1,239	133	3	8	20	52	71	100
3	Karnál	...	...	...	14	13	868	184	18	15	25	30	91	158
HISSAR DIVISION.														
4	Hissar	...	...	...	13	8	715	11	...	...	2	1	11	9
5	Rohtak	...	...	...	11	9	498	23	4	1	3	13	30	51
6	Sirsa	...	...	...	13	4	626	13	...	...	4	...	5	6
UMBALLA DIVISION.														
7	Umballa	...	...	...	20	20	2,225	494	37	28	48	143	181	292
8	Ludhiána	...	...	...	10	10	851	81	10	9	10	2	17	21
9	Simla	...	...	...	4	...	238	...	...	...	...	...	...	...
JULLUNDUR DIVISION.														
10	Jullundur	...	...	...	10	3	1,233	6	...	1	...	...	1	4
11	Hoshiárpur	...	...	...	14	8	2,178	18	1	1	3	3	2	2
12	Kángra	...	...	...	15	5	704	6	...	...	...	1	1	2
UMRITSAR DIVISION.														
13	Umritsar	...	...	...	10	10	1,078	32	...	2	10	16	62	95
14	Gurdáspur	...	...	...	17	12	2,302	42	1	5	4	6	9	13
15	Siálkot	...	...	...	13	7	2,315	14	...	7	1	...	2	...
LAHORE DIVISION.														
16	Lahore	...	...	...	21	19	1,672	64	38	72	65	119	148	96
17	Gujránwála	...	...	...	9	7	1,177	11	...	...	4	5	6	3
18	Ferozepore	...	...	...	15	12	1,276	50	1	2	5	9	11	12
RAWALPINDI DIVISION.														
19	Rawalpindi	...	...	...	19	7	1,725	20	14	8	7	11	9	25
20	Jhelum	...	...	...	13	8	1,042	9	...	1	1	...	3	2
21	Gujrát	...	...	...	9	2	1,416	6	1	...	1	...	1	...
22	Shahpur	...	...	...	15	5	632	10	1	1	10	2	...	...
MOOLTAN DIVISION.														
23	Mooltan	...	...	...	14	10	1,233	52	17	11	12	16	12	11
24	Jhang	...	...	...	13	4	976	4	1	...	...	1	1	...
25	Montgomery	...	...	...	18	17	1,518	112	6	2	11	4	18	25
26	Muzaffargarh	...	...	...	13	6	534	7	...	1	1	2	1	1
DERAJAT DIVISION.														
27	Dera Ismail Khan	...	...	...	19	12	772	59	4	10	14	16	10	28
28	Dera Gházi Khan	...	...	...	17	10	422	33	10	5	9	27	18	11
29	Bannu	...	...	...	13	12	553	33	6	2	9	8	12	12
PESHAWAR DIVISION.														
30	Pesháwar	...	...	...	18	18	730	153	97	75	44	100	77	77
31	Hazára	...	...	...	15	3	1,013	3	1	...	...	...	...	...
32	Kohát	...	...	...	11	11	469	75	49	28	37	47	23	29
Total for the Province					446	297	34,973	1,777	358	334	408	682	895	1,104

PUNJAB during each month of the year 1882.

July.	August.	September.	October.	November.	December.	6			7		8			9	10
						Total.			Number of these deaths among children.		Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous 5 years.	Number.
						Males.	Females.	Total.	Under one year.	One and under 12 years.	Males.	Females.	Total.		
13	3	...	...	20	40	186	144	330	66	253	0.54	0.48	0.51	0.56	1
68	17	12	6	71	184	340	272	612	126	457	1.00	0.90	0.95	2.52	2
82	57	55	19	34	59	368	275	643	185	414	1.09	0.96	1.03	2.68	3
1	2	...	...	...	7	16	17	33	5	27	0.06	0.07	0.06	0.68	4
27	7	5	2	56	235	231	203	434	74	356	0.78	0.79	0.78	0.75	5
3	2	1	2	1	1	14	11	25	2	19	0.10	0.09	0.10	1.07	6
189	117	94	39	57	43	711	537	1,248	352	842	1.21	1.12	1.17	1.73	7
22	13	9	6	6	8	80	53	133	38	94	0.23	0.19	0.21	1.26	8
...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.20	9
1	1	2	5	...	...	7	8	15	2	12	0.02	0.02	0.02	0.36	10
5	...	1	...	1	2	15	6	21	5	16	0.03	0.01	0.02	0.60	11
1	...	1	...	...	...	5	1	6	...	...	0.01	...	0.01	0.14	12
81	22	5	8	14	38	183	170	353	99	243	0.37	0.42	0.39	1.95	13
4	1	6	3	1	5	32	26	58	13	40	0.07	0.07	0.07	0.95	14
3	1	1	...	...	3	10	8	18	11	6	0.02	0.02	0.02	0.78	15
49	17	12	5	4	4	334	295	629	127	477	0.65	0.71	0.68	2.19	16
2	1	...	...	1	3	10	15	25	9	15	0.03	0.05	0.04	1.40	17
15	12	10	4	4	7	53	39	92	18	72	0.15	0.13	0.14	1.11	18
17	2	2	1	...	2	43	52	95	27	62	0.10	0.14	0.12	1.22	19
1	4	1	...	1	...	7	7	14	7	7	0.02	0.02	0.02	1.12	20
...	...	...	1	...	2	3	3	6	4	2	0.01	0.01	0.01	1.72	21
1	...	...	...	...	...	7	8	15	12	3	0.03	0.04	0.03	1.60	22
3	1	2	2	4	1	46	46	92	22	60	0.15	0.18	0.17	1.22	23
...	...	...	1	...	...	...	4	4	2	2	...	0.02	0.01	0.74	24
23	26	34	18	17	9	102	91	193	33	115	0.44	0.47	0.45	2.73	25
...	...	...	...	...	1	6	1	7	3	3	0.03	0.01	0.02	2.24	26
8	5	2	6	1	1	55	50	105	20	78	0.23	0.25	0.24	2.60	27
2	5	1	1	...	...	48	41	89	19	51	0.24	0.25	0.24	1.34	28
20	2	2	4	4	4	44	41	85	23	56	0.25	0.26	0.25	3.08	29
87	38	14	10	20	35	366	308	674	118	542	1.11	1.17	1.14	1.63	30
3	1	...	...	...	1	3	3	6	1	5	0.01	0.01	0.01	0.77	31
13	11	14	22	10	33	158	158	316	58	243	1.56	1.97	1.74	1.17	32
744	368	286	165	307	728	3,486	2,893	6,379	1,481	4,572	0.34	0.33	0.34	1.35	

DEATHS REGISTERED from FEVERS in the DISTRICTS of

1 Number.	2 DISTRICTS.					3 Circles of Registration.		4 Villages.		January.	February.	March.	April.	May.
						Number in each district.	Number from which deaths from fevers were reported.	Number in each district.	Number from which deaths from fevers were reported.					
	DELHI DIVISION.													
1	Delhi					15	15	743	649	1,218	907	1,052	1,187	1,382
2	Gurgaon... ..					15	15	1,239	974	1,287	875	896	956	1,035
3	Karnál					14	14	868	767	1,223	812	1,044	791	1,206
	HISSAR DIVISION.													
4	Hissar					13	13	715	667	615	395	508	557	657
5	Rohtak					11	11	498	470	782	570	731	756	887
6	Sirsa					13	13	626	492	286	255	273	297	330
	UMBALLA DIVISION.													
7	Umballa... ..					20	20	2,225	2,068	1,827	1,149	1,260	1,338	1,585
8	Ludhiána					10	10	851	778	598	401	471	469	592
9	Simla					4	4	238	61	11	13	15	13	23
	JULLUNDUR DIVISION.													
10	Jullundur					10	10	1,233	1,099	1,004	648	709	604	863
11	Hoshiárpur					14	14	2,178	1,954	1,164	773	866	745	1,245
12	Kángra					15	15	704	611	1,159	820	829	849	1,094
	AMRITSAR DIVISION.													
13	Amritsar					10	10	1,078	952	1,448	850	868	754	1,081
14	Gurdáspur					17	17	2,302	2,277	1,443	880	884	720	1,143
15	Siálkot					13	13	2,315	2,040	1,418	897	770	662	1,186
	LAHORE DIVISION.													
16	Lahore					21	21	1,672	1,391	1,732	993	982	806	1,111
17	Gujránwála					9	9	1,177	898	756	496	521	397	720
18	Ferozepore					15	15	1,276	952	652	443	442	483	501
	RAWALPINDI DIVISION.													
19	Rawalpindi					19	19	1,725	1,252	1,324	982	1,074	867	944
20	Jhelum					13	13	1,042	851	600	483	500	504	489
21	Gujrát					9	9	1,416	1,158	672	527	465	483	611
22	Shahpur					15	15	632	582	457	332	376	282	359
	MOOLTAN DIVISION.													
23	Mooltan					14	14	1,233	871	1,155	810	759	727	698
24	Jhang					13	13	976	635	394	326	350	278	286
25	Montgomery					18	18	1,518	862	972	537	433	334	474
26	Muzaffargarh					13	13	534	521	554	456	545	419	535
	DERAJAT DIVISION.													
27	Dera Ismail Khan					19	19	772	630	528	506	525	540	368
28	Dera Gházi Khan					17	17	422	367	372	279	315	325	312
29	Bannu					13	13	553	401	414	373	382	404	276
	PESHAWAR DIVISION.													
30	Pesháwar					18	18	730	532	711	547	621	599	497
31	Hazára					15	14	1,013	767	681	577	518	359	442
32	Kohát					11	11	469	289	204	181	145	151	114
Total for the Province						446	445	34,973	28,818	27,661	19,093	20,129	18,656	23,046

the PUNJAB during each month of the year 1882.

5							6			7			8	9
June.	July.	August.	September.	October.	November	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 for previous 5 years.	Number.
							Males.	Females.	Total.	Males.	Females.	Total.		
1,124	680	679	891	762	1,036	1,345	6,553	5,710	12,263	19·05	19·06	19·06	32·10	1
908	630	770	1,212	1,066	1,112	1,573	6,708	5,612	12,320	19·79	18·52	19·19	33·21	2
1,318	752	915	1,137	881	1,050	1,294	6,700	5,723	12,423	19·93	19·98	19·95	26·44	3
644	495	713	837	559	708	710	3,959	3,439	7,398	14·54	14·83	14·67	17·59	4
879	696	815	1,115	805	826	1,228	5,512	4,578	10,090	18·61	17·79	18·22	28·62	5
250	202	308	279	369	288	291	1,900	1,528	3,428	13·70	13·33	13·53	17·47	6
1,732	1,359	1,327	2,213	1,823	1,783	2,245	10,504	9,137	19,641	17·85	19·07	18·40	20·45	7
625	557	756	909	1,103	1,202	1,126	4,654	4,155	8,809	13·70	14·88	14·23	20·84	8
23	21	23	35	30	18	18	128	115	243	4·64	7·49	5·66	8·50	9
873	777	876	1,003	1,019	1,192	1,336	5,649	5,255	10,904	13·09	14·67	13·81	29·54	10
1,211	878	1,267	1,553	1,484	1,621	1,469	7,399	6,877	14,276	15·36	16·38	15·84	20·94	11
1,111	829	964	1,231	1,120	895	945	6,304	5,542	11,846	16·55	15·83	16·21	17·01	12
1,182	971	1,016	1,159	1,576	1,865	1,808	7,864	6,714	14,578	16·63	16·68	16·32	24·31	13
1,052	948	983	1,275	1,467	1,562	1,829	7,674	6,512	14,186	17·21	17·23	17·22	19·75	14
1,164	1,000	1,033	1,300	1,659	1,687	1,984	7,929	6,831	14,760	14·69	14·46	14·58	15·62	15
1,104	833	1,003	1,238	2,079	2,606	2,956	9,240	8,203	17,443	18·10	19·82	18·87	23·67	16
771	661	708	785	1,272	1,529	1,686	5,488	4,814	10,302	16·45	16·99	16·70	20·06	17
575	532	797	995	1,201	1,151	1,157	4,852	4,077	8,929	13·58	13·90	13·72	19·43	18
938	840	1,057	1,263	2,184	4,316	3,523	9,844	9,473	19,317	21·91	25·52	23·54	27·06	19
479	428	588	944	1,792	4,623	3,718	7,542	7,606	15,148	24·06	27·56	25·70	18·24	20
613	587	645	844	1,011	1,319	1,367	4,693	4,451	9,144	12·96	13·61	13·27	16·41	21
349	236	368	834	2,188	3,699	2,905	6,126	6,259	12,385	27·63	31·32	29·38	14·30	22
581	554	562	1,562	2,617	2,416	2,556	8,086	6,911	14,997	26·55	27·93	27·17	18·06	23
277	200	287	702	1,590	2,078	1,750	4,328	4,190	8,518	20·19	23·16	21·55	8·43	24
348	315	301	382	649	834	1,029	3,606	3,002	6,608	15·48	15·51	15·49	15·33	25
415	298	477	1,492	3,214	2,799	1,648	6,518	6,334	12,852	35·32	41·10	37·95	21·36	26
400	374	392	1,066	2,064	2,187	2,189	5,845	5,294	11,139	24·51	26·05	25·22	16·36	27
329	240	328	1,218	2,238	1,593	1,386	4,948	3,987	8,935	24·66	24·51	24·59	11·85	28
293	310	334	561	784	1,303	1,172	3,468	3,138	6,606	19·54	20·23	19·86	14·24	29
558	469	376	533	561	834	991	4,023	3,274	7,297	12·21	12·44	12·31	13·88	30
392	415	650	938	875	788	998	3,923	3,710	7,633	17·94	19·69	18·75	15·15	31
124	115	112	128	257	349	382	1,212	1,050	2,262	11·95	13·09	12·46	10·06	32
22,642	18,202	21,430	31,634	42,299	51,269	50,619	183,179	163,501	346,680	17·95	18·92	18·40	20·77	

DEATHS REGISTERED from BOWEL COMPLAINTS in the

1	2					3		4						
Number.	DISTRICTS.					Circles of Registration.		Villages.		January.	February.	March.	April.	May.
						Number in each district.	No. from which deaths from bowel complaints were reported.	Number in each district.	No. from which deaths from bowel complaints were reported.					
	DELHI DIVISION.													
1	Delhi	...	...	...	...	15	15	743	152	46	27	40	56	47
2	Gurgaon	...	...	...	...	15	15	1,239	150	42	36	43	39	58
3	Karnál	...	...	...	...	14	14	868	97	61	32	40	38	49
	HISSAR DIVISION.													
4	Hissar	...	...	...	...	13	13	715	105	13	14	16	16	24
5	Rohtak	...	...	...	...	11	11	498	45	15	6	13	10	9
6	Sirsa	...	...	...	...	13	13	626	95	10	3	20	18	20
	UMBALLA DIVISION.													
7	Umballa	...	...	...	...	20	20	2,225	423	91	32	48	71	75
8	Ludhiána	...	...	...	...	10	10	851	124	14	15	26	24	28
9	Simla	...	...	...	...	4	4	238	45	7	5	5	4	8
	JULLUNDUR DIVISION.													
10	Jullundur	...	...	...	...	10	9	1,233	68	16	19	16	19	31
11	Hoshiárpur	...	...	...	...	14	14	2,178	328	65	26	43	65	136
12	Kángra	...	...	...	...	15	15	504	363	72	54	63	102	201
	AMRITSAR DIVISION.													
13	Amritsar	...	...	...	...	10	10	1,078	203	65	28	23	35	38
14	Gurdáspur	...	...	...	...	17	17	2,302	325	39	28	21	35	66
15	Siálkot	...	...	...	...	13	13	2,315	490	39	35	27	38	89
	LAHORE DIVISION.													
16	Lahore	...	...	...	...	21	19	1,672	121	40	34	31	39	53
17	Gujránwála	...	...	...	...	9	9	1,177	113	22	18	17	18	32
18	Ferozepore	...	...	...	...	15	14	1,276	151	20	6	20	20	20
	RAWALPINDI DIVISION.													
19	Rawalpindi	...	...	...	...	19	17	1,725	347	121	85	89	66	102
20	Jhelum	...	...	...	...	13	13	1,042	290	69	47	57	57	67
21	Gujrát	...	...	...	...	9	9	1,416	176	19	26	20	24	25
22	Shahpur	...	...	...	...	15	15	632	144	34	25	26	24	31
	MOOLTAN DIVISION.													
23	Mooltan	...	...	...	...	14	13	1,233	124	30	25	23	30	32
24	Jhang	...	...	...	...	13	12	976	117	18	7	16	20	22
25	Montgomery	...	...	...	...	18	17	1,518	91	20	11	7	9	20
26	Muzaffargarh	...	...	...	...	13	12	534	55	8	10	3	8	10
	DERAJAT DIVISION.													
27	Dera Ismail Khan	...	...	...	...	19	16	772	53	20	23	23	25	22
28	Dera Gházi Khan	...	...	...	...	17	10	422	17	4	2	3	2	7
29	Bannu	...	...	...	...	13	13	553	80	14	22	8	11	15
	PESHAWAR DIVISION.													
30	Pesháwar	...	...	...	...	18	17	730	66	28	15	16	19	12
31	Hazára	...	...	...	...	15	13	1,013	40	5	8	6	7	9
32	Kohát	...	...	...	...	11	11	469	47	7	2	5	5	8
Total for the Province						446	423	34,973	5,045	1,074	726	814	954	1,366

DISTRICTS of the PUNJAB during each month of the year 1882.

5							6			7			8	9
June.	July.	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 for previous 5 years.	Number.
							Males.	Females.	Total.	Males.	Females.	Total.		
40	50	62	88	66	73	60	369	286	655	1·07	0·95	1·02	2·25	1
31	56	95	101	67	51	51	369	301	670	1·09	0·99	1·04	2·81	2
62	55	61	73	48	42	42	358	245	603	1·06	0·85	0·97	1·74	3
20	29	53	54	29	29	32	202	127	329	0·74	0·55	0·65	1·00	4
14	22	34	30	31	21	20	127	98	225	0·43	0·38	0·41	1·09	5
17	11	40	23	14	8	17	124	77	201	0·89	0·67	0·79	1·24	6
80	73	96	153	134	106	87	632	414	1,046	1·07	0·86	0·98	2·01	7
38	27	47	50	45	44	49	230	177	407	0·68	0·63	0·66	1·39	8
7	9	8	20	7	5	17	59	43	102	2·14	2·80	2·37	3·49	9
22	23	53	52	41	44	38	199	175	374	0·46	0·49	0·47	0·70	10
71	56	103	130	99	83	58	534	401	935	1·11	0·95	1·04	2·00	11
163	149	121	148	145	122	105	764	681	1,445	2·00	1·94	1·98	2·33	12
30	43	60	85	91	94	66	409	249	658	0·83	0·62	0·74	1·67	13
59	65	74	116	96	69	63	447	284	731	1·00	0·75	0·89	1·34	14
52	58	87	122	114	84	67	485	327	812	0·90	0·69	0·80	0·83	15
38	29	42	56	48	54	59	356	167	523	0·70	0·40	0·56	0·99	16
32	19	36	39	44	32	49	232	126	358	0·69	0·44	0·58	0·84	17
11	30	38	56	60	44	35	250	110	360	0·70	0·37	0·55	0·77	18
83	90	140	151	163	145	128	740	623	1,363	1·65	1·68	1·66	1·58	19
73	65	97	113	131	104	119	568	431	999	1·81	1·56	1·69	1·78	20
15	37	43	52	53	45	28	211	176	387	0·58	0·54	0·56	0·87	21
42	19	37	49	55	45	49	268	168	436	1·21	0·84	1·03	1·46	22
20	20	38	73	108	98	87	376	208	584	1·23	0·84	1·06	0·87	23
13	28	25	27	22	37	50	184	101	285	0·86	0·56	0·72	0·53	24
20	12	4	15	16	17	31	118	64	182	0·51	0·33	0·43	0·47	25
5	8	10	12	17	26	15	77	55	132	0·42	0·36	0·39	0·30	26
17	9	17	18	23	33	38	157	111	268	0·66	0·55	0·61	0·63	27
4	5	17	16	40	35	21	92	64	156	0·46	0·39	0·43	0·50	28
21	25	27	62	25	30	46	165	141	306	0·93	0·91	0·92	1·19	29
22	30	23	19	27	25	24	179	81	260	0·54	0·31	0·44	0·94	30
11	5	14	7	11	9	8	64	36	100	0·29	0·19	0·24	0·87	31
4	1	7	9	8	6	6	44	24	68	0·43	0·30	0·37	0·68	32
1,137	1,158	1,609	2,019	1,878	1,660	1,565	9,389	6,571	15,960	0·92	0·76	0·85	1·34	

REPORT

ON THE

SANITARY ADMINISTRATION

OF THE

PUNJAB

THE YEAR 1882.

In Lieu Reports
F
Punjab



Lahore:

AT THE ALBERT PRESS,

1883.